Number 306
March 16, 1979

CONTRIBUTIONS IN SCIENCE
NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY

SYSTEMATICS OF THE SPECIES OF *CRYPTORHOPALUM* (COLEOPTERA: DERMESTIDAE) OCCURRING IN CALIFORNIA

By R.S. Beal, Jr.

Published by the NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY • 900 EXPOSITION BOULEVARD • LOS ANGELES, CALIFORNIA 90007

CONTENTS

Abstract 3
Systematics 3
Abbreviations 4
Generic Nomenclature and Description
Cryptorhopalum Guérin-Méneville 4
Key to Adults from California 6
Descriptions and Discussions of California Species
Cryptorhopalum triste LeConte 7
Cryptorhopalum rubidum new species 10
Cryptorhopalum uteanum Casey 12
Cryptorhopalum apicale (Mannerheim) 15
Cryptorhopalum fusculum LeConte 17
Cryptorhopalum filitarse Casey 18
Cryptorhopalum balteatum LeConte 19
Cryptorhopalum haplotes new species 20
Synonymies and Lectotype Designations
for *C. reversum* and *C. pruddeni* 20
Acknowledgments 21
Literature Cited 21

The *Science Bulletin* and *Contributions in Science* of the Natural History Museum of Los Angeles County were merged into a single imperial octavo serial, retaining the name *Contributions in Science* and beginning with Number 301.

This serial has been newly formatted for maximum use of typography and illustrations per page, and sized for maximum use of paper. All photography has been produced utilizing a 200-line screen for detail.

Since most institutions rebind *Contributions in Science* collectively into hardbound volumes, and many researchers using them desire to photocopy material, two new features have been incorporated into the new format. A suggested citation line provides the abbreviated serial title, year, number of publication, and total pagination, and appears in the lower left corner of each page; and pages of *Contributions in Science* have been printed off-center to provide a two-inch gutter between adjacent pages for easier accessibility in photocopying.

ISSN: 0459–8113

Suggested Citation: *Contrib. Sci. Natur. Hist. Mus. Los Angeles County*. 1979. **306**:1–22.

Contributions in Science are articles in the earth and life sciences, presenting results of original research in Natural History. *Science Bulletin* (Numbers 1–30; 28 June 1965 to 10 April 1978) and *Contributions in Science* Numbers 1–300; 23 January 1957 to 16 June 1978) were merged into a single imperial octavo serial beginning with Number 301.

SYSTEMATICS OF THE SPECIES OF *CRYPTORHOPALUM* (COLEOPTERA: DERMESTIDAE) OCCURRING IN CALIFORNIA[1]

By R.S. Beal, Jr.[2]

ABSTRACT: The following described species are recognized as occurring in California: *C. triste* LeConte (= *C. modestum* Casey, *C. fusciclave* Casey, NEW SYNONYMS), *C. uteanum* Casey (= *C. nephianum* Casey, *C. aridum* Casey, *C. bakeri* Casey, NEW SYNONYMS), *C. apicale* (Mannerheim) (= *C. coloradense* Casey, *C. tuckeri* Casey, *C. fontinale* Casey, *C. grisescens* Casey, NEW SYNONYMS), *C. fusculum* LeConte (= *C. anthrax* Casey, *C. granum* Casey, *C. pumilum* Casey, *C. piceum* Casey, NEW SYNONYMS, and *C. affine* Casey, REVISED SYNONYMY), *C. filitarse* Casey, and *C. balteatum* LeConte. Two new species are described: *C. rubidum,* for which Yuma, Arizona, is the type locality, and *C. haplotes,* known only from Jacumba, California. The species can best be distinguished by characters found associated with the aedeagus and lateral lobes and with the eighth morphological abdominal sternum of the males. Redescriptions of existing species are provided together with lectotype designations wherever necessary. A key to the species is provided for forms of adults occurring in California. Flower hosts, geographic distribution, and synonymies are given for each species insofar as known. In addition to the species above, synonymies are given and lectotypes designated for two species closely related to *C. balteatum* but occurring outside California: *C. reversum* Casey (= *C. festivum* Casey, *C. balteatum* Casey [non *balteatum* LeConte], *C. pallens* Casey, NEW SYNONYMS), and *C. pruddeni* Casey (= *C. insigne* Casey, *C. anthrenoides* Casey, NEW SYNONYMS).

Adults of the genus *Cryptorhopalum* are small, ovate beetles, almost always taken on flowers, and readily recognized as dermestids by the presence of a median ocellus and a hind coxa grooved for the reception of the femur. The two-segmented antennal club, which fits closely into a fossa on the underside of the prothorax, and the covering of hairs rather than of scales easily separates them from all other Nearctic dermestids.

Relatively large numbers of specimens of the genus are found in the collections of most insect museums. Nevertheless, no revision of the genus has been undertaken since that of Thomas L. Casey in 1900. Because Casey worked from very small numbers of specimens and described his species from a typological rather than a population concept, his "species" in many instances are simple variants of previously described species or of another of his species. Consequently his key to the species is of little value. There is a clear need to investigate the species from a population concept, to develop a workable key for distinguishing them, and to provide accurate descriptions for them. This paper is an effort to accomplish these goals for those species presently known to occur in California.

Other than records of flowers on which the adults are found, very little is known of the biology of species of *Cryptorhopalum*. Larvae of some unidentified species have been intercepted at border inspection stations on cheese and other food products from Mexico. Nevertheless, no Nearctic species has ever been known to occur as a pest of stored food products. Larvae of a very rare Arizona species, *C. poorei,* have been found associated with spider nests under the bark of dead ponderosa pine trees (Beal 1975), yet an association with spider nests does not seem to be a likely natural habitat for larvae of most of the species, judging from their numbers and the situations in which adults are often found. Hopefully, the present study will stimulate further investigations into the biologies of the species.

SYSTEMATICS

Species Characters

Adults of some species are readily distinguished by patterns formed on the elytra by light and dark colored setae or by the shapes of the antennal club. The form of the anterior tibia is diagnostic for a few species, as is the density of punctation on the pronotum. Some species, however, are virtually indistinguishable from each other on the basis of external characters. Nevertheless, apparently reliable characters for the recognition of all California species and for many other Nearctic species are found in struc-

---

[1]Review Committee for this Contribution:
Charles L. Hogue
John M. Kingsolver
Floyd G. Werner

[2]Northern Arizona University, Flagstaff, Arizona, 86011.

tures associated with the male genital apparatus.

The male genital tube is formed by the terga and the sterna of the 8th and 9th morphological abdominal segments, the weakly sclerotized tegmen (or basal piece) that lies beneath the base of the aedeagus, and the lateral lobes and aedeagus. Except in copulation, these parts are telescoped together within the abdomen. Discriminating characters are found in the shape of the aedeagus, in the shape of the lateral lobes and the "bridge" that connects the two lobes, and most particularly in the shape of the apical margin of the sternum of abdominal segment 8 and the form of the setae that are inserted on it.

Species Identification

Any effort to identify species on the basis of external characters alone is complicated by two problems. One is the relative paucity of such characters. The other is the relatively large degree of geographic variation that occurs over the range of some of the species. It is usually fairly easy to separate members of any two species occurring within a limited geographic area. Yet convergence of external characters may make quite difficult separation of specimens of one species from those of another from a distance of only a few hundred miles. In the key that follows, an effort is made to distinguish only those forms of each species that are found in California. However, the formal description for each is given for all variations within its entire range, as far as known.

Species Groups

Based on the total number of known adult characters, the Nearctic species fall into three rather distinct groups. The California representatives of these groups are the following.

TRISTE group
- *C. triste* LeConte
- *C. rubidum,* new species
- *C. uteanum* Casey
- *C. apicale* (Mannerheim)
- *C. fusculum* LeConte

QUADRIPUNCTATUM group
- *C. filitarse* Casey
- *C. balteatum* LeConte

HAPLOTES group
- *C. haplotes,* new species

The *quadripunctatum* group is characterized by the presence of an appendage-like structure on each lateral posterior angle of the 8th (morphological) abdominal sternum of the male (Figs. 14, 15). Externally it is characterized by the presence of three bands of light-colored pubescence on the elytron, a feature not found in members of either the *triste* or *haplotes* groups. As far as the California species are concerned, the *quadripunctatum* group is further separable by the ovate outline of the male antennal club. In distinction to this, members of the *haplotes* and *triste* groups have a subcylindrical antennal club in the males.

In members of the *triste* group the 8th (morphological) abdominal sternum of the male lacks lateral appendage-like structures or sublateral marginal papillae but has a posterior median process at the apex of which are various specialized setae. The one exception is *C. rubidum,* which has a median cluster of setae but no process. The dorsal setae in members of this group are commonly unicolorous, but if bicolorous they do not form three more or less distinct bands on the elytron. (*C. apicale* usually has bicolorous setae and these often form an oblique subbasal band and a subapical spot, but there is no submedian band.)

The *haplotes* group, for which there is but a single Nearctic representative, is distinguished from both of the preceding groups by its more elongate form (Fig. 1). The 8th (morphological) sternum of the male lacks a median apical process and lateral appendage-like structures, but possesses sublateral papillae on which are inserted several moderately long setae (Fig. 12). The margin of the sternum has a cluster of setae inserted at the midline. The dorsal setae are unicolorous, at least in this and the one Mexican species I have studied.

C. rubidum is the least specialized of all the species considered, at least as far as the male genital structures are concerned. Conceivably it could be placed in a separate group or attached to any of the three groups as its most primitive member. However, here it is placed in the *triste* group because of its very close similarity in external characters to *C. uteanum.*

ABBREVIATIONS

In the discussion of species below, museums frequently referred to are abbreviated as follows: CAS — California Academy of Sciences, San Francisco; MCZ — Museum of Comparative Zoology, Cambridge, Massachusetts; LACM — Natural History Museum of Los Angeles County, California; NMNH — United States National Museum of Natural History, Washington, D.C.

GENERIC NOMENCLATURE AND DESCRIPTION

Cryptorhopalum Guérin-Méneville

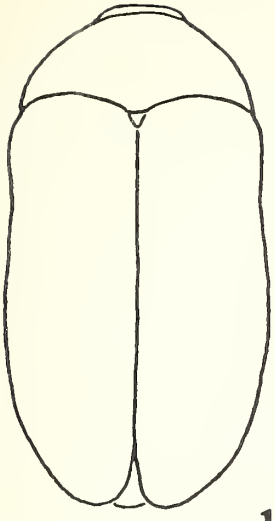
Cryptorhopalum Guérin-Méneville 1834 (1838), p. 67. LeConte 1854, pp. 106–107. Reitter 1880 (1881), p. 43. Jayne 1882, p. 364. Casey 1900, pp. 145, 155. Sharp 1902, p. 652. Rees 1943, p. 11. Beal 1959, p. 101 (in key to genera). Beal 1975, pp. 228–233 (larval description).

Cryptorrhopalum Arrow 1915, pp. 437, 442.

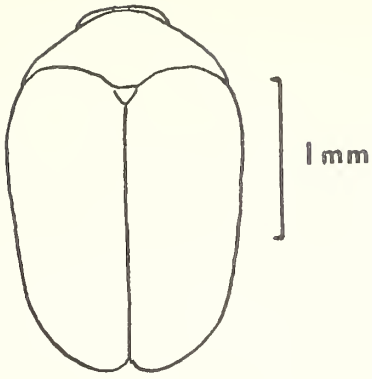
Type of the genus: *Cryptorhopalum quadripunctatum* Guérin-Méneville 1838.

DESCRIPTIONS

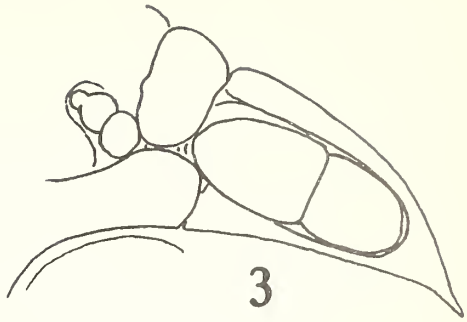
ADULT MALES: Body ovate, moderately convex, covered on dorsal surfaces with moderately short, subrecumbent hairs; scales absent although some setae may be slightly ensiform. Head slightly inflexed with front inclined 10 to 30 degrees from the vertical; median ocellus present. Antenna 11-segmented; club 2-segmented, ovate or subcylindrical; segment 10 subequal in length to segment 11 or longer than segment 11. Pronotum carinate on lateral margins but without sublateral carinae or impunctate areas; basal lobe not raised (on same plane as posterior margins), projecting posteriad moderately to strongly. Scutellum visible. Elytra across humeri slightly wider than width of pronotum at base; epipleuron inflexed with surface in approximately same plane as metepisternum. Prosternum with anterior margin very weakly or not at all deflexed, arcuately rounding to sides with area in front of lateral margin of procoxa somewhat longer than area in front of middle of procoxa; process moderately broad, received in mesosternal sulcus, and attaining mesosternum. Hypomeron with fossa closely conforming to size and shape of antennal club; fossa occupying most of hypomeron and margined behind by thread-like carina; posterior margin of



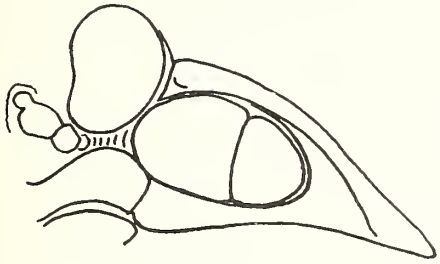
1



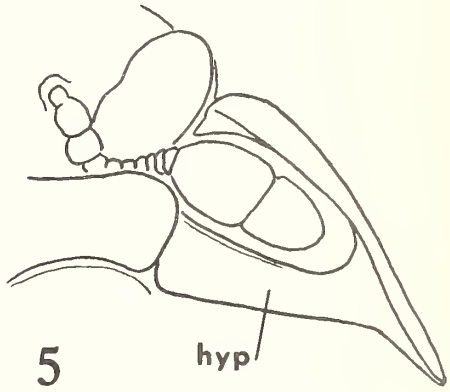
2



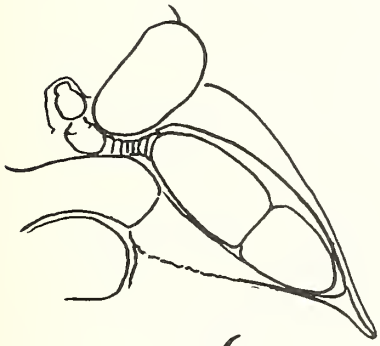
3



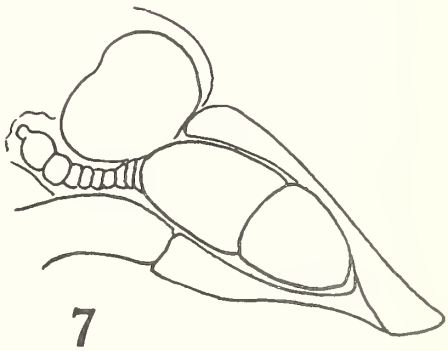
4



5



6



7

FIGURES 1–7. Figure 1: Dorsal aspect of *C. haplotes*. Figure 2: Dorsal aspect of *C. apicale*. Figure 3: Underside of prothorax showing antennal club in place within antennal fossa of male of *C. haplotes*. Figure 4: Same of male of *C. balteatum*. Figure 5: Same of female of *C. haplotes* (hyp = hypomeron). Figure 6: Same of male of *C. rubidum*. Figure 7: Same of male of *C. fusculum*.

KEY TO ADULTS FROM CALIFORNIA

1. Subbasal, subapical, and apical bands and sometimes basal band of light-colored pubescence present on elytron; basal and subbasal bands sometimes coalesce. Basal half of 1st visible abdominal sternum with 2 oblique striae extending from beneath each trochanter (leg may need to be relaxed and moved to observe character). Male antennal club ovate (Fig. 4). Female with 2 circular foveae on disc of 5th visible abdominal sternum (Fig. 33) 2

— Elytral pubescence unicolorous, or with subapical spot of light-colored pubescence with or without subbasal band of light-colored pubescence, or covered with light-colored pubescence with few to many intermingled dark hairs, particularly at apical third. Basal half of 1st visible abdominal sternum with 1 oblique stria extending from beneath each trochanter. Male antennal club more or less elongate, subcylindrical (Figs. 3, 5–7). Female without 2 circular foveae on disc of 5th visible abdominal sternum 3

2. Light-colored pubescence of elytron a deep gold color (orichalceous). Integument of pronotum generally appreciably darker in color than elytron at base. Sternum of 8th (morphological) abdominal segment without cluster of setae at middle of apical margin; lateral process with stout, curved seta at apex (Fig. 15) ..... *balteatum*

— Light-colored pubescence of elytron white with slight golden cast. Integument of pronotum and base of elytron usually identically colored. Sternum of 8th (morphological) abdominal segment with cluster of setae at middle of apical margin; lateral process with slender seta at apex (Fig. 14) ..... *filitarse*

3. Form elongate: ratio of width (across humeri) to length (of pronotum and elytra) 1:1.85 or longer (Fig. 1) ..... *haplotes*

— Form more ovate: ratio of width to length 1:1.80 or shorter (Fig. 2) 4

4. Pubescence of elytron consisting of piceous to black hairs with subapical patch of light golden or whitish pubescence (rarely limited to as few as 3 or 4 light-colored hairs) with or without subbasal band of golden or whitish pubescence, or (form limited to southern deserts) elytron completely covered with whitish pubescence except for few scattered blackish hairs, mostly at apical ⅓. Both segments of antennal club identically colored (ochreous to reddish) ..... *apicale*

— Pubescence of elytron uniformly light golden or piceous but not whitish and without subbasal band or subapical patch of light-colored hairs. Segments of antennal club variously colored 5

5. Protibia expanded at apex (Fig. 29). Pronotum with punctures of disc about 1⅓ times diameter of facet of eye and separated by ½ to 2 times diameter of single puncture. Male antennal club dark reddish brown to black. ..... *triste*

— Protibia gradually narrowing from middle to apex (as in Fig. 30). Pronotum with punctures of disc no wider than diameter of facet of eye and separated by 3 or more times diameter of single puncture, or, if not separated by more than twice diameter of puncture, then proximal segment of male antennal club light yellowish brown to ochreous. Male antennal club light or dark 6

6. Male with hypomeron continued behind antennal fossa; hypomeron about as wide at narrowest point behind fossa as width of segment 3 of antenna. Male and female antennal clubs with segment 10 light yellowish brown or light ochreous and segment 11 usually somewhat darker, particularly on anterior side and at apex. Pronotum and elytra usually dark mahogany brown to black with pronotum same color as elytra (lighter colored specimens probably teneral) ..... *fusculum*

— Male with hypomeron behind lateral ⅓ of antennal fossa obliterated or narrowed to no more than half width of segment 3 of antenna (not including width of carina bounding fossa). Segments of antennal club in males and females concolorous or segment 11 darker than segment 10, but when segment 11 darker, then segment 10 rufous rather than light yellowish brown or ochreous. Head and pronotum usually black to dark mahogany with elytra rufous; elytra frequently dark mahogany at base and along basal half of median suture and rufous apically and along sides 7

7. (Species indistinguishable by external morphological characters.) 8th (morphological) sternum more or less evenly rounded apically with cluster of simple setae at middle and without extended median process bearing two recurved setae (Fig. 9); aedeagus without proximally directed hook at genital pore (Fig. 22). Western California deserts from Inyo Mts. to Yuma ..... *rubidum*

— 8th (morphological) sternum with distal process bearing tight cluster of acutely pointed setae and two, long, recurved setae at apex (Fig. 13, 17); aedeagus with proximally directed hook at opening of genital pore (Fig. 24). Western Texas to SW Wyoming across Utah and Nevada to California; in California in coastal range and along coast ..... *uteanum*

hypomeron sharply angled with or without feeble, thread-like carina. Mesosternal disc completely divided by deep and broad sulcus for reception of prosternal process. Metasternal episternum less than ¼ as wide as metasternum. Metasternal epimeron broadly joined to lateral margin of metasternal coxa. Legs with tibia spinose on dorsal margin but without teeth; tarsus of hind leg with first segment subequal in length to or slightly longer than second segment.

ADULT FEMALES: As males except antennal club about half size of male club; antennal fossa correspondingly smaller.

DISCUSSION: Members of the genus are characteristically dermestid-like, having a distinct median ocellus, the hind coxa grooved for the reception of the femur, and the head hypognathous and partially recessed within the pronotum. They somewhat resemble members of the genus *Anthrenus* in size and shape, but are covered with hairs rather than scales. The most distinctive character is the 2-segmented antennal club, in which the segments are subequal or segment 10 is longer than segment 11. Members of *Orphinus* Motschulsky, which in the United States occur only in Florida and Hawaii, have a 2-segmented club, but segment 11 is greatly enlarged and nearly round with segment 10 at most only a third as long.

The genus most nearly related to *Cryptorhopalum* seems to be *Hemirhopalum* Sharp, a Neotropical genus. According to Sharp (1902) members of *Hemirhopalum* lack a median ocellus, have "a large, but ordinary, laxly-jointed" male antennal club, and have "the sides of the thorax beneath" with "a large impression which is shallow behind instead of a depression that exactly fits the club of the antennae: this impression in front is broadly open." I have not seen any specimens with the particular characters that Sharp seems to have described. I have seen unidentified Neotropical species that belong to the same species group as *C. haplotes*. I suspect that some of the species now placed in *Hemirhopalum* properly belong in the *haplotes* group within *Cryptorhopalum*. Obviously there is a definite need for a revisionary study of the Neotropical members of both genera.

Aside from *Hemirhopalum*, species of *Cryptorhopalum* appear to have the closest affinities with *Orphinus* and *Thaumaglossa* Redtenbacher. This judgment is based on larval as well as adult characters. Significantly, the larvae of all 3 genera have a cluster of hastisetae inserted on the membrane behind each side of the tergum of abdominal segment 7, but not behind any other segment. The endemic Hawaiian genus *Labrocerus* also has larvae that are quite similar to those of *Cryptorhopalum* (Beal 1975), although the elongated form and the many-segmented antennal club of the adults make them appear more closely related to *Megatoma* or *Trogoderma*. *Cryptorhopalum, Orphinus, Thaumaglossa,* and *Labrocerus* most likely share a more recent common ancestry than any one of these genera does with any other genus of Dermestidae for which larval characters are known.

GEOGRAPHIC DISTRIBUTION: The genus is primarily Neotropical with 120 species currently recognized from South and Central America. Probably a total of 18 species occur within the United States, including 3 as yet undescribed from states other than California. The genus is found across the entire country with the exception of the northern New England States. The greatest proliferation of Nearctic species is in the southwest.

DESCRIPTIONS AND DISCUSSION OF CALIFORNIA SPECIES

Cryptorhopalum triste LeConte

Cryptorhopalum triste LeConte, 1854, p. 111. Reitter, 1880 (1881), p. 44. Jayne 1882, p. 367. Casey, 1900, p. 158. Blatchley, 1910, p. 594. Casey, 1916, p. 191. Hatch, 1962, p. 290.
Cryptorhopalum nigricorne LeConte, 1861, p. 344.
Cryptorhopalum picicorne LeConte, 1854, p. 111. Casey, 1900, p. 159. Dillon and Dillon, 1961, pp. 375, 376. Kirk, 1969, p. 57.
Cryptorhopalum modestum Casey, 1900, p. 158 NEW SYNONYMY.
Cryptorhopalum fusciclave Casey, 1900, p. 158 NEW SYNONYMY.

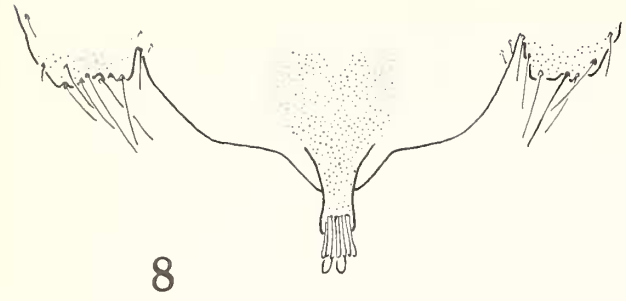
DESCRIPTIONS

ADULT MALES: Dorsal pubescence uniformly piceous to light golden brown. Dorsal integument immaculate, black to yellowish brown. Antennal club subcylindrical.

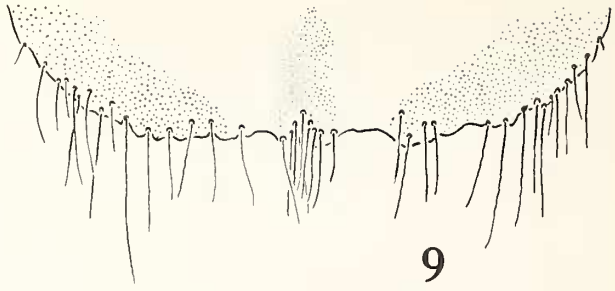
Pronotum with punctures of disc about 1⅓ times diameter of facet of eye and separated by ½ to 2 times diameter of single puncture. Antennal club light brown to black; ratio of width to length of segment 10 varying from 1:1.2 to 1:1.7; ratio of length of segment 11 to length of segment 10 varying from 1:1.1 to 1:1.8. Carina on lateroposterior margin of antennal fossa attaining margin of hypomeron so that hypomeron not continuous behind fossa or carina not quite attaining margin of hypomeron so that plane of hypomeron continued very narrowly behind carina with hypomeron at narrowest point no wider than twice width of carina bounding fossa. Prosternal process without median carina. Metasternum with long or short diagonal stria originating at margin behind mesocoxa and directed toward lateroposterior angle of metasternum. First abdominal sternum with single oblique stria extending on each side from anterior margin of segment beneath trochanter for about ¾ length of segment. Tibia of front leg slightly expanded and widest at apex (Fig. 29). Eighth (morphological) sternum with apical margin as illustrated (Fig. 10); two dorsal setae of median process inserted close together, their sockets separated by less than width of single socket and positioned distad to insertions of setae of ventral brush; setae of ventral brush erect, compact; each seta with obtuse apex (Fig. 20). Aedeagus and lateral lobes as illustrated (Fig. 19); base of aedeagus furcate with hinges widely separated. Ratio of width (across humeri) to length (of pronotum and elytra) varying from 1:1.55 to 1:1.73. Length ranging from 1.92 mm to 2.45 mm.

ADULT FEMALES: As males except antennal fossa occupying about half area of hypomeron. 5th visible abdominal sternum without foveae. Length ranging from 2.06 mm to 2.83 mm.

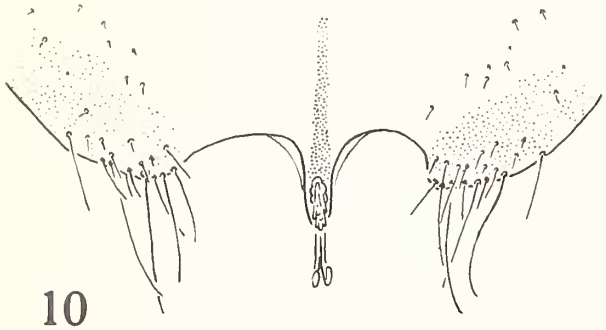
LECTOTYPE DESIGNATIONS: The lectotype of *C. triste* is herewith designated as the second of the two specimens standing under the name in the LeConte collection in the MCZ. From the original description, in which LeConte indicated a range of size for the species, it is obvious that he had more than one specimen before him when he wrote the description. The first specimen in the series, one which bears a "type" label (probably placed on it by Nathan Banks), is not *C. triste* as the species was interpreted by Jayne, Casey, and Hatch, but is *C. apicale* Mannerheim. This first specimen happens to bear a label with the species name on it in LeConte's handwriting, but judging from the pin holes in the label, it has been removed at least four times and there is no



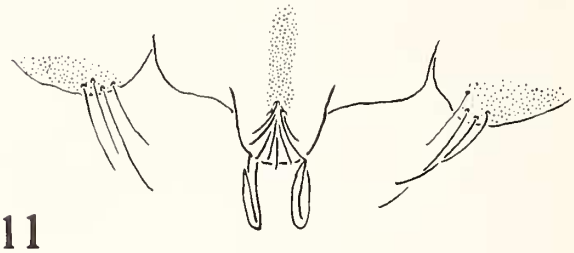
8



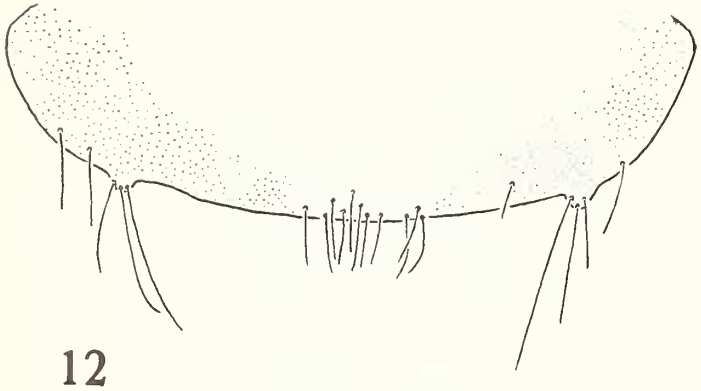
9



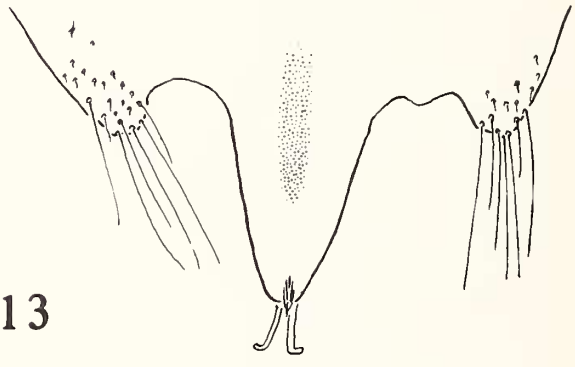
10



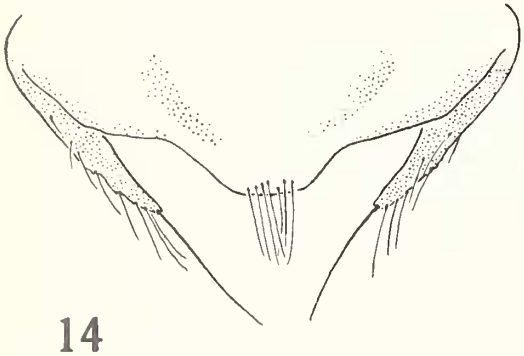
11



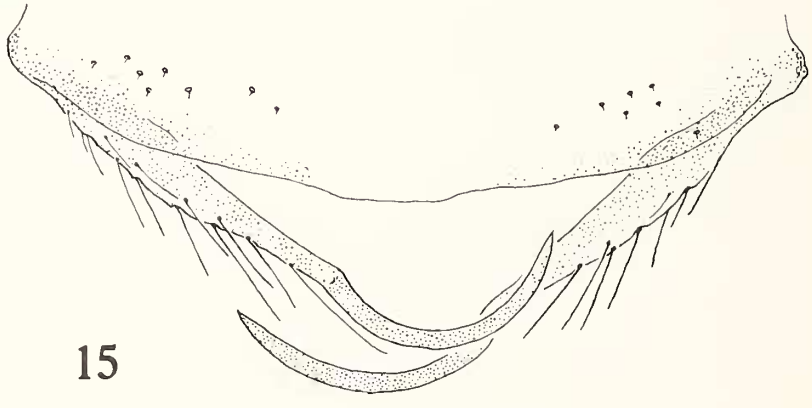
12



13

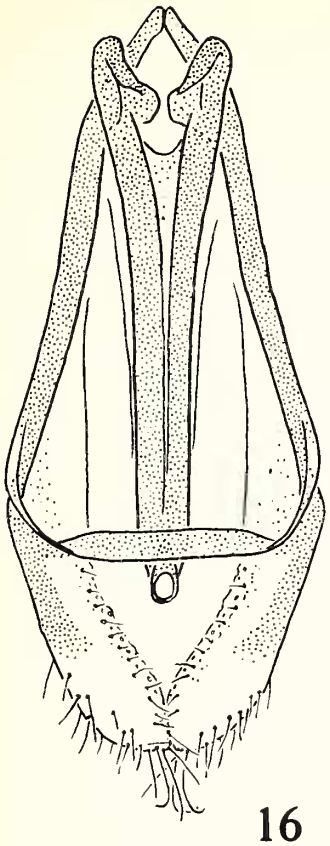


14

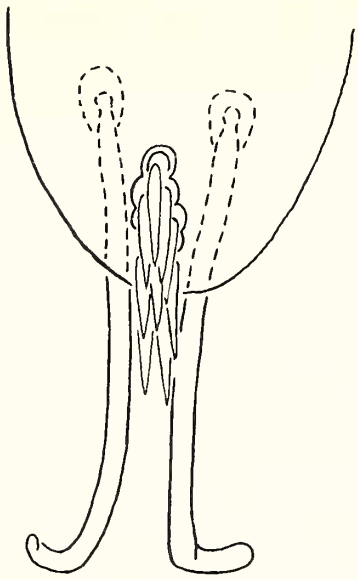


15

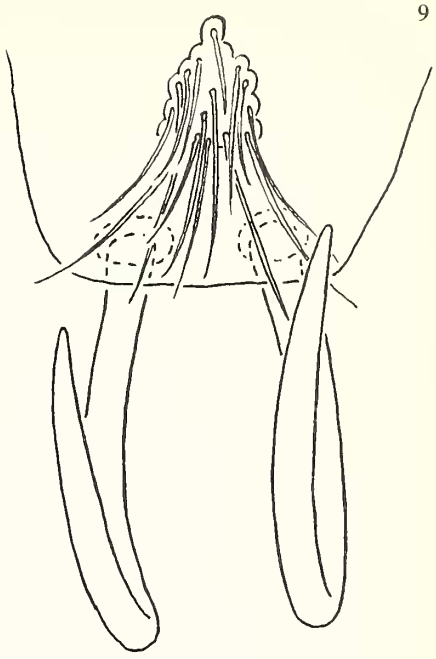
FIGURES 8–15. Apical margin of morphological abdominal sternum 8 of males of species of *Cryptorhopalum*. Figure 8: *fusculum*. Figure 9: *rubidum*. Figure 10: *triste*. Figure 11: *apicale*. Figure 12: *haplotes*. Figure 13: *uteanum*. Figure 14: *filitarse*. Figure 15: *balteatum*.



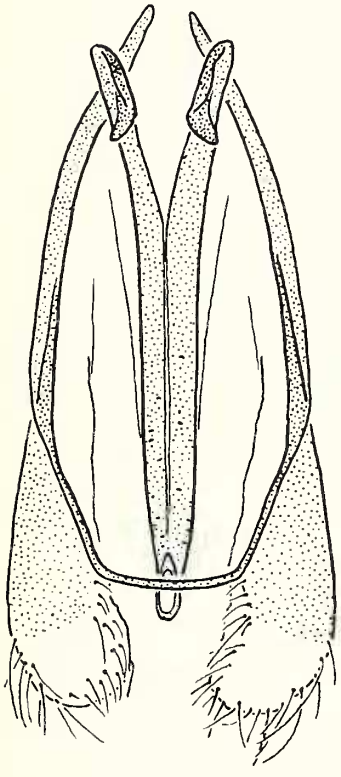
16



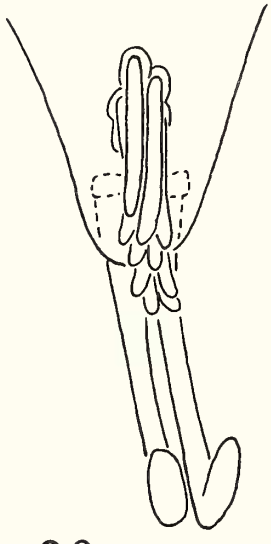
17



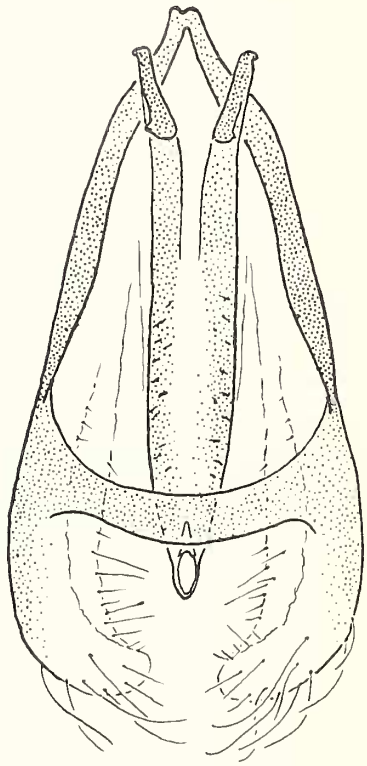
18



19



20



21

FIGURES 16–21. Figure 16: Ventral aspect of aedeagus and lateral lobes of *C. haplotes*. Figure 17: Detail of apical process of abdominal sternum 8 of *C. uteanum*. Figure 18: Same of *C. apicale*. Figure 19: ventral aspect of aedeagus and lateral lobes of *C. triste*. Figure 20: Detail of apical process of abdominal sternum 8 of *C. triste*. Figure 21: Ventral aspect of aedeagus and lateral lobes of *C. balteatum*.

certainty that it is now on the specimen on which it was originally placed by LeConte. Nomenclatural stability can best be assured by designating the second specimen as the lectotype. The type locality is San Jose, California.

The lectotype of *C. nigricorne* LeConte is herewith designated as the specimen in the LeConte collection in the MCZ bearing the type label No. 6879. The type-locality is California.

The lectotype of *C. picicorne* LeConte is herewith designated as the specimen in the LeConte collection in the MCZ bearing the type label No. 6878. The pink label on the specimen is LeConte's symbol for "Middle States."

The lectotype of *C. modestum* Casey is herewith designated as the specimen in the Casey collection in the NMNH bearing the type label No. 37572. The type-locality is Brownsville, Texas.

The holotype of *C. fusciclave* in the Casey collection in the NMNH bears the type label No. 37573. The type-locality is Texas.

GEOGRAPHIC DISTRIBUTION: The species is found from northern New York State (and doubtlessly into Canada) to Florida and west to Kansas, Oklahoma, and Texas. No specimens have been found in the Rocky Mountain states, but it is common in the Pacific Coast states (Fig. 36). Whether the two populations are continuous through Canada or (less likely) through Mexico is not known at present. It is possible that the California population, which appears quite homogeneous, is an introduction by early emigrants. Collections of the species have been made in the Mexican states of Nuevo León, Tamaulipas, Veracruz, and Puebla, but, to the author's knowledge, not on the western side of the Sierra Madre Occidental.

DISCUSSION: This species can be recognized with moderate ease, being distinguished by the slightly expanded apex of the front tibia and the relatively dense punctation of the pronotum. Some specimens of *C. apicale* have pronotal punctation almost as dense as that found in *C. triste*. However, wherever these two species are known to occur sympatrically, that form of *C. apicale* is found in which most of the elytron is covered with dark pubescence with an area of light colored pubescence present near the apex of each elytron. The dorsal pubescence of *C. triste* is always unicolorous. The two species are also distinguished in California by the light ochreous to rufous color of the antennal club in *C. apicale* and the dark reddish brown to black color of the antennal club in *C. triste*. The longer, narrower shape of the male antennal club and the much narrower rim of the hypomeron behind the antennal fossa in the male of *C. triste* will further serve to distinguish the species. *C. triste* is more difficult to distinguish from dark forms of *C. uteanum* and from *C. fusculum*, but the denser pronotal punctation and the expanded apex of the front tibia should make its separation positive.

INFRASPECIFIC VARIATIONS: Specimens from New Jersey and Maryland are generally narrower than specimens from California, but the ranges of ratios of width to length slightly overlap. On the other hand, specimens from Kansas, Oklahoma, and Arkansas have a range of ratios of width to length broadly overlapping both those of the East Coast and the West Coast. The light reddish brown color of the dorsal pubescence and the piceous to black color of the antennal club characterize specimens from both the East Coast, the West Coast and the Middle Plains states. Specimens from Florida and along the Rio Grande River in Texas have a somewhat lighter dorsal pubescence and a light brown to reddish brown antennal club. Not enough specimens have been available from Mexico to warrant conclusions about variations in populations there. However, a series of ten specimens from the State of Puebla in Central Mexico is scarcely distinguishable from specimens from the Central Atlantic United States.

ECOLOGY: Adults are collected on a wide variety of flowers. The most extensive records of their occurrences on flowers have been made by A.R. Moldenke (P.H. Raven, *in litt.*) for collections from San Mateo County, California. Why they come to some flowers and not to others is not apparent, but it will be noticed from the following list that their most frequent occurrences are on members of the lily family and on flowers clustered into inflorescences. In the following list, flower species on which three or more collections of *C. triste* have been made are followed by an asterisk. Liliaceae: *Brodiaea hyacinthina* (Lindl.) Baker*, *B. peduncularis* (Lindl.) Wats., *Calochortus venustus* Dougl.*, *C. luteus* Dougl., *Muilla maritima* (Torr.) Wats.; Iridaceae: *Sisyrinchium bellum* Wats.; Ranunculaceae: *Ranunculus californicus* Benth.; Cruciferae: "mustard"; Rosaceae: *Amelanchier* sp., *Adenostoma fasciculatum* H. & A.*, *Prunus ilicifolia* Walp., *Rosa* sp., *Potentilla* sp.; Leguminosae: *Melilotus* sp.; Polygalaceae: *Polygala alba* Nutt.; Rhamnaceae: *Ceanothus sorediatus* H. & A., *Ceanothus* sp.; Cactaceae: *Opuntia* sp.; Umbelliferae: *Lomatium utriculatum* (T. & G.) C. & R., *Daucus carota* L., *Heracleum lanatum* Michx.; Cornaceae: *Cornus* sp.; Asclepiadaceae: *Asclepias* sp.; Hydrophyllaceae: *Phacelia* sp., *Eriodictyon californicum* (H. & A.) Greene*; Scrophulariaceae: *Penstemon* sp.; Compositae: *Achillea borealis* Bong.*, *Baeria* sp., *Bidens* sp.*, *Cirsium* sp., *Coreopsis* sp., *Erigeron* sp., *Eriophyllum confertiflorum* Gray*, *Lasthenia chrysostoma* (F. & M.) Greene*, *Rudbeckia hirta* L., *Solidago* sp., *Wyethia angustifolia* Nutt., *W. glabra* Gray. Blatchley (1910) recorded the species in Indiana on yellow puccoon (*Lithospermum* sp., Boraginaceae), red haw (*Crataegus coccinea* L., Rosaceae), and goldenrod (*Solidago* sp., Compositae).

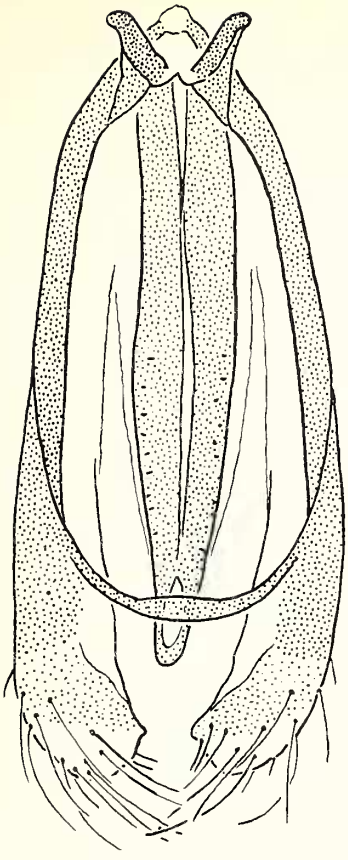
Cryptorhopalum rubidum NEW SPECIES

DIAGNOSIS: 8th (morphological) abdominal sternum of male without lateral processes, sublateral marginal papillae, or median posterior process but with cluster of simple setae at midline near apical margin; apex of aedeagus without proximally directed hook.

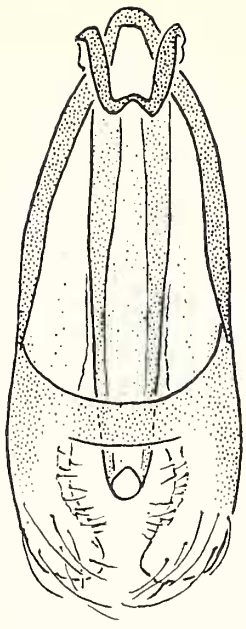
DESCRIPTIONS

ADULT MALE: Dorsal pubescence uniformly golden brown. Integument of dorsal surfaces with head, pronotum, and base of elytra piceous; elytra becoming ochreous red on sides and on apical half. Antennal club subcylindrical.

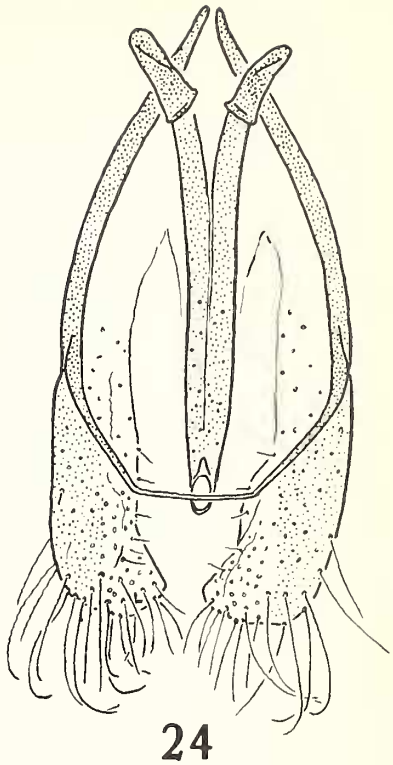
Pronotum with punctures of disc about ¾ diameter of facet of compound eye and separated by 4 to 5 times diameter of single puncture. Antennal club with both segments fuscous; segment 10 with ratio of width to length 1:1.45; length of segment 11 to segment 10 with ratio of 1:1.15. Carina on lateroposterior margin of antennal fossa attaining margin of hypomeron so that plane of hypomeron not continuous behind fossa (Fig. 6). Prosternal process with slight transverse convexity and without median carina. Metasternum with very short, almost transverse stria originating at posterior margin of socket of mesocoxa. First abdominal sternum with single oblique stria on each side extending about ½ length of segment from anterior margin of segment beneath trochanter. Tibia of front leg widest at middle and taper-



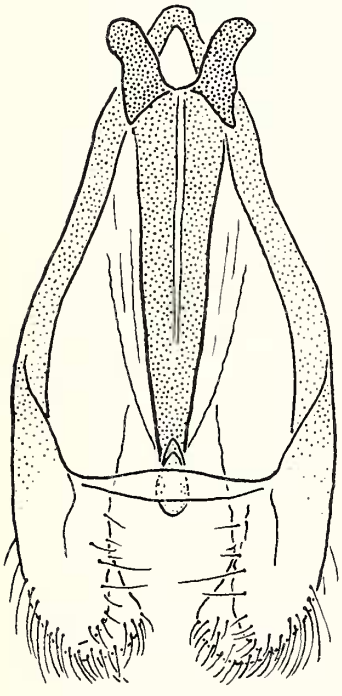
22



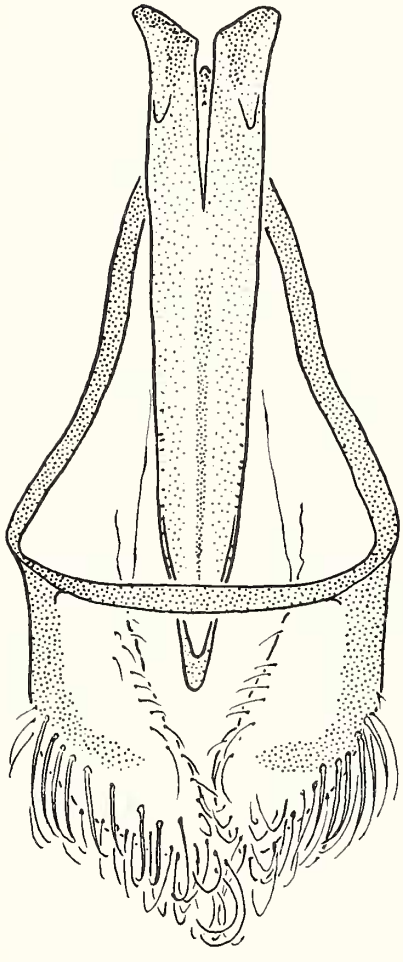
23



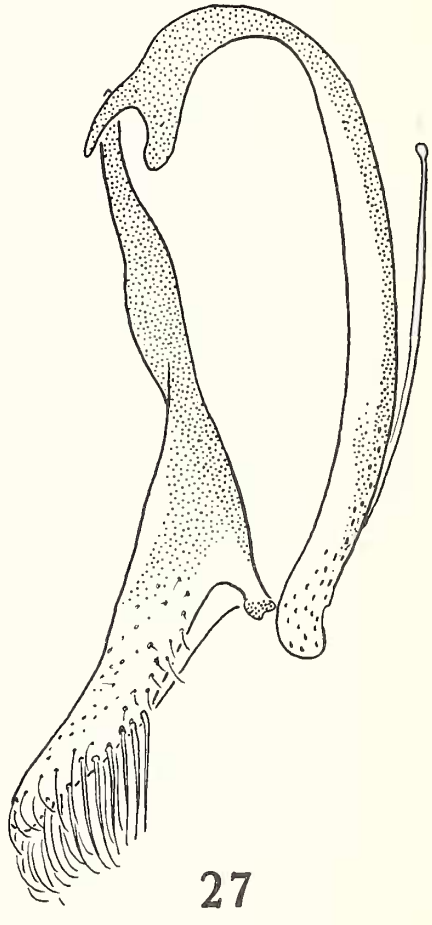
24



25



26



27

FIGURES 22–27. Figure 22: Ventral aspect of aedeagus and lateral lobes of *C. rubidum*. Figure 23: Same of *C. filitarse*. Figure 24: Same of *C. uteanum*. Figure 25: Same of *C. apicale*. Figure 26: Same of *C. fusculum*. Figure 27: aedeagus and lateral lobes of *C. fusculum* in lateral aspect; for clarity, apex of aedeagus is figured ventrad of bridge whereas it is normally positioned dorsad (inside) of bridge.

ing very slightly toward apex. Eighth (morphological) abdominal sternum with apical margin as illustrated (Fig. 9); no apical median process present but dense brush of setae present at middle of margin. Aedeagus and lateral lobes as illustrated (Fig. 22). Ratio of width (across humeri) to length (of pronotum and elytra): 1:1.67. Length: 1.92 mm.

ADULT FEMALE: Elytra entirely ochreous red. Ratio of width to length of segment 10 of antenna 1:1.42; ratio of length of segment 11 to length of segment 10, 1:1.11. Antennal fossa occupying about half of area of hypomeron. 5th visible abdominal sternum without foveae. Ratio of width (across humeri) to length (of pronotum and elytra) 1:1.72. Length 2.57 mm.

RANGE OF OBSERVED VARIATIONS: Elytra entirely ochreous red, or dark brown or black at basal 1/5 gradually becoming reddish brown on apical half. Antennal club of male with ratio of width to length of segment 10 varying from 1:1.4 to 1:1.9; ratio of length of segment 11 to length of segment 10 varying from 1:1.2 to 1:1.7. Plane of hypomeron continued behind antennal fossa or not; if continued behind fossa, then no wider at narrowest point than ⅓ times width of segment 3 of antenna. Ratio of width (across humeri) to length (of pronotum and elytra) varying from 1:1.61 to 1:1.76. Length of males ranging from 1.90 mm to 2.26 mm; of females ranging from 2.09 mm to 2.95 mm.

TYPE OF MATERIAL: *Holotype* male, allotype female, 17 paratypes: Yuma, Arizona, April 13, 1955, Butler and Tuttle. Additional paratypes as follows: Palm Canyon [Kofa Mts., Yuma Co.] Ariz., May 29, 1955 (G. Butler and D. Tuttle), 3 spm.; Roll, Arizona, April 14, 1955 (Butler and Werner), 1 spm.; Inyo Mountains, California, 7000 to 9000 feet elevation, July 7–11 (Wickham), 16 spms.; Potholes [near Laguna Dam], Imperial County, California, April 9, 1923 (E.P. VanDuzee), 3 spms. Holotype and allotype deposited in the CAS collection. Paratypes distributed to collections of the CAS, LACM, MCZ, NMNH, the University of Arizona, and the University of Wisconsin.

ETYMOLOGY: The specific epithet is a Latin adjective meaning "reddish" or "brownish" in reference to the color of the elytra.

DISCUSSION: The reddish orange (rarely reddish brown) color of the apical ½ and often of the entire elytra contrasting with the black head and pronotum superficially distinguish this species from any California *Cryptorhopalum* except *C. uteanum*. Occasional specimens of *C. apicale* may have elytra that are dark at the base and rufous apically. These may be distinguished from specimens of *C. rubidum* in that the elytral pubescence of *C. apicale* is mostly dark with a distinct subapical spot of white pubescence, or the elytral pubescence is whitish, rather than golden brown. Specimens of *C. uteanum* usually have a darker reddish brown elytral integument than specimens of *C. rubidum*, but this is not invariably true. The author knows of no consistent external character by which these 2 species may be distinguished. However, the males are easily separated by the very distinctive differences in the structure of the 8th (morphological) sternum.

ECOLOGY: The specimens from Yuma were collected on mesquite (*Prosopis* sp.), and the 3 females from Palm Canyon, Arizona, were taken on the mint *Hyptis emoryi* Torr. *in* Ives.

Cryptorhopalum uteanum Casey

Cryptorhopalum uteanum Casey 1916, p. 195.
Cryptorhopalum nephianum Casey 1916, p. 196 NEW SYNONYMY.
Cryptorhopalum aridum Casey 1916, p. 196 NEW SYNONYMY.
Cryptorhopalum bakeri Casey 1916, p. 197 NEW SYNONYMY.

DESCRIPTIONS

ADULT MALES: Dorsal pubescence uniformly whitish to light golden brown. Integument of head and pronotum black, integument of elytra entirely black or reddish with suffused black area at base and along suture at basal third, or entirely reddish.

Pronotum with punctures of disc equal in diameter to diameter of facet of compound eye and separated by 3 to 4 times diameter of puncture. Antennal club black except for suffused dark reddish area at base of segment 10, or segment 11 reddish black with segment 10 ochraceous; ratio of width to length of segment 10 varying from 1:1.28 to 1:1.92; ratio of length of segment 11 to length of segment 10 varying from 1:1.15 to 1:1.51. Antennal fossa at lateroposterior margin reaching posterior margin of hypomeron so that plane of hypomeron not continuous behind fossa, or plane of hypomeron continued very narrowly behind fossa with plane at narrowest point behind fossa no wider than twice width of carina bounding fossa. Prosternal process transversely convex without median carina. Metasternum with short diagonal stria originating at margin behind mesocoxa and directed toward middle of lateral margin of metasternum. First (visible) abdominal sternum with single oblique stria on each side extending from anterior margin of segment beneath trochanter for about ¾ length of segment. Tibia of front leg widest at basal third and tapering very slightly to apex, or sides parallel from basal third to apex. Morphological abdominal sternum 8 with apical margin as illustrated (Fig. 13); two recurved dorsal setae of median process inserted proximally to ventral brush of setae with bases separated about twice width of one socket; setae of ventral brush erect, compact, with acute apices (Fig. 17). Aedeagus and lateral lobes as illustrated (Fig. 24); base of aedeagus furcate with hinges widely separated. Ratio of width (across humeri) to length (of pronotum and elytra) varying from 1:1.60 to 1:1.74. Length varying from 1.94 mm to 2.52 mm.

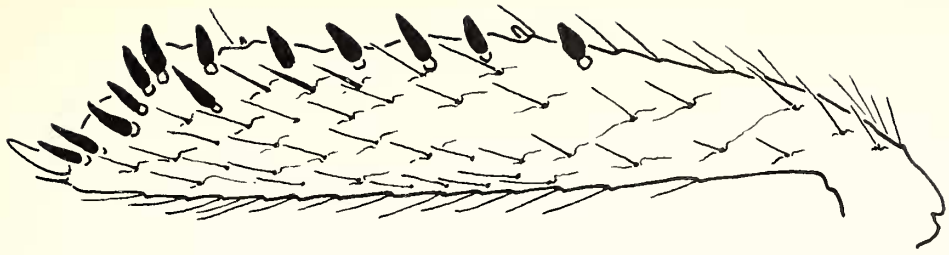
ADULT FEMALES: As males except that antennal fossa occupying about ½ area of hypomeron and antennal club correspondingly smaller. 5th visible abdominal sternum without foveae. Ratio of width (across humeri) to length (of pronotum and elytra) varying from 1:1.62 to 1:1.80. Length varying from 2.06 mm to 2.83 mm.

LECTOTYPE DESIGNATIONS AND NOMENCLATURE: A male from Provo, Utah, bearing NMNH type No. 37562 is herewith designated as the lectotype of *C. uteanum*. A male from the same series was dissected and the genitalia found to be similar to the structures figured for this species.

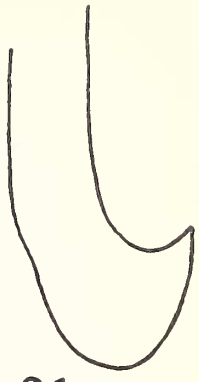
A female from Nephi, Utah, bearing NMNH type No. 73561 is herewith designated as the lectotype of *C. nephianum*. This specimen and the 2 females next to it in the Casey collection definitely appear to be synonyms of *C. uteanum* although confirming male genitalic characters are not available.

A male from 8,000 ft. elevation in the Inyo Mts. of California bearing NMNH type label No. 37568 is herewith designated as the lectotype of *C. aridum*. Another specimen from the same series was dissected and found to have genitalic characters identical to those of *C. uteanum*.

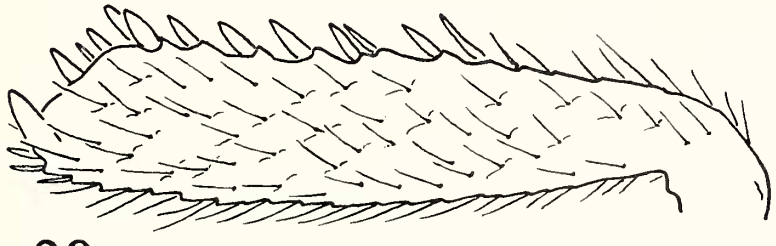
The unique female from "Mts. near Claremont, Calif." for which Casey erected the species *C. bakeri* (NMNH type No. 37563) has here been placed in synonymy with *C. uteanum*, since it seems to match this species better than any other. The identification carries a certain degree of uncertainty.



28

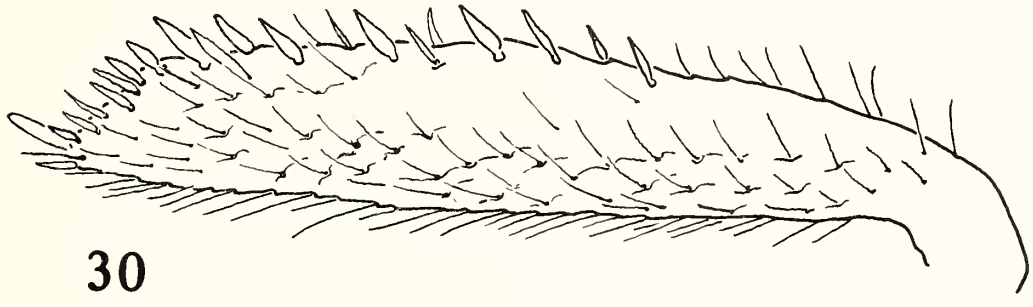


31

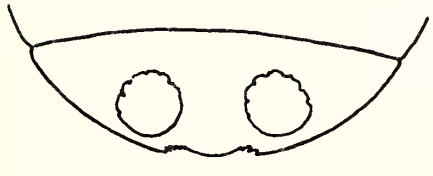


29

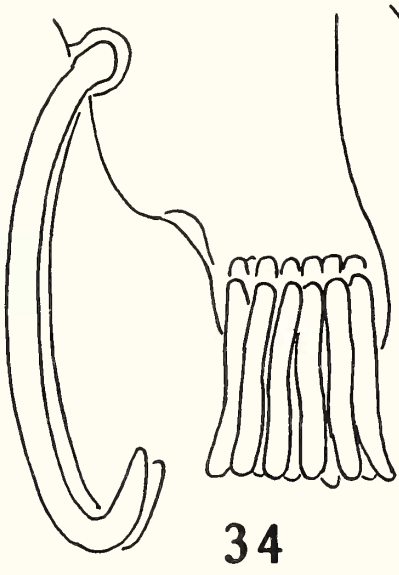
32



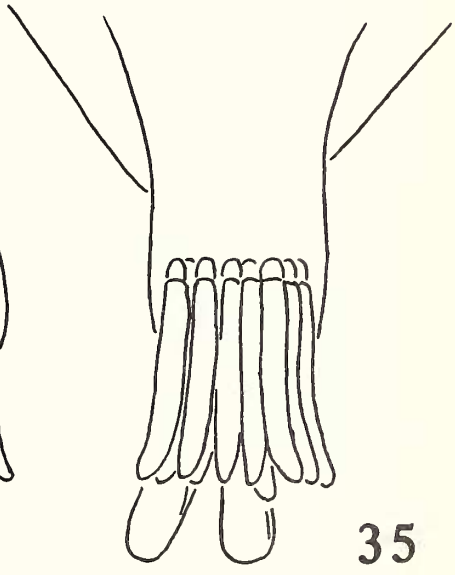
30



33



34



35

FIGURES 28–35. Figure 28: Posterior view of left front tibia of *C. haplotes*. Figure 29: Same of *C. triste*. Figure 30: Same of *C. apicale*. Figure 31: Lateral view of apex of aedeagus of *C. triste*. Figure 32: Same of *C. filitarse*. Figure 33: Fifth visible abdominal sternum of female of *C. filitarse*. Figure 34: Detail of apex of median process of abdominal sternum 8 of *C. fusculum* in lateral view. Figure 35: Same in ventral view.

FIGURE 36. Nearctic distribution of *C. triste*.

DISCUSSION: This species and *C. rubidum* cannot be distinguished by any consistent external character. Males of *C. uteanum* and *C. rubidum* are easily distinguished, however, by those genitalic characters described for each. Males of *C. uteanum* can be distinguished from males of *C. fusculum* and *C. apicale* in that *C. uteanum* males have a very narrow or obliterated extension of the hypomeron behind the antennal fossa. In males of both *C. fusculum* and *C. apicale* the hypomeron behind the fossa is at least ⅔ as wide as segment 3 of the antenna. Color characters can usually be used to separate both males and females of *C. uteanum* from those of *C. apicale* and *C. fusculum*. Specimens of *C. apicale* usually have a subapical spot of white pubescence on the elytron or are covered with mostly whitish hair with some intermingled dark hairs, whereas the dorsal pubescence of *C. uteanum* is always a uniform light golden white to golden brown. *C. fusculum* is ordinarily piceous or black in color. The integument of California specimens of *C. uteanum* always includes a certain amount of rufous coloration on the elytron.

INFRASPECIFIC VARIATIONS: Moderate series of the species have been taken from San Diego County, California, southern Utah and northern Arizona, and the southeastern corner of Arizona. Specimens from San Diego County tend to have darker, mahogany red elytra in contrast to the lighter ochreous red of specimens from southern Utah and northern Arizona. Specimens from the Chiricahua Mts. in southwestern Arizona and from the Davis Mts. in western Texas are entirely black.

DISTRIBUTION (See Fig. 37) ARIZONA: Cochise Co.: Chiricahua Mts., July 9, 1959 (D.J. and J.N. Knull); same locality, July 26, 1952 (D.J. and J.N. Knull). Coconino County: Cameron, June 6, 1967 (C.D. Johnson); Cameron, Little Colorado River, June, 1967 (C.D. Johnson); Soap Creek at Cliff Dwellers, 7 mi. southwest of Marble Canyon, June 5, 1953 (G.D. Butler). CALIFORNIA: Contra Costa Co.: Berkeley, July 19, 1958 (J.A. Litsinger). Inyo Co.: Silver Canyon, White Mts., May 10, 1926 (J.O. Martin). Los Angeles Co.: Downey, May, 1945. San Diego Co.: 1 mi. south Del Mar, May 23, 1971 (M. and A. Gilbert); Idyllwild, June 20, 1958 (P.S. Bartholomew); Julian, June 12, 1963 (C.D. Johnson); 2 miles west Mt. Springs (E.P. Van Duzee); San Diego, May 10, June 8, 9, 12, 1920 (E. Schiffel). NEVADA: Elko Co.: Wendover, June 12, 1933 (J.T. Howell). Nye Co.: Tonopah, June 1, 1914. NEW MEXICO: San Miguel Co.: Las Vegas H.S., July 2, 4, 6, 9 (Barber and Schwarz). TEXAS: El Paso Co.: El Paso, June 27, 1921 (C.D. Duncan); Ft. Bliss, May 1, 1915 (J.I. Carlson). Jeff Davis Co.: Davis Mts., July 6, 1936 and July 15, 1955 (D.J. and J.N. Knull). WYOMING: Sweetwater Co.: Green River, July 2, 1920.

Four specimens in the CAS are labeled as taken at Seabrook, Texas (Galveston Co.). One specimen in the collection of V.M. Kirk is labeled as being from Yankton, S.D. I believe both of these localities should be reconfirmed, since they are outside the apparent range of the species.

ECOLOGY: Adults have been collected on the crucifer *Stanleya* sp., on the garden stock, *Matthiola incana* (L.) R. Br., and on carrot blossoms.

Cryptorhopalum apicale (Mannerheim)

Anthrenus apicale Mannerheim 1843, p. 258.
Cryptorhopalum apicale: Jayne 1882, p. 366. Reitter 1880 (1881), p. 44. Casey, 1900, p. 157. Hatch 1962, p. 290.
Cryptorhopalum haemorrhoidale Horn 1894 (pars), p. 321.
Cryptorhopalum coloradense Casey 1916, pp. 192–193 NEW SYNONYMY.
Cryptorhopalum tuckeri Casey 1916, p. 192 NEW SYNONYMY.
Cryptorhopalum fontinale Casey 1916, p. 194 NEW SYNONYMY.
Cryptorhopalum grisescens Casey 1916, p. 195 NEW SYNONYMY.

DESCRIPTIONS

ADULT MALES. Dorsal pubescence entirely whitish, or entirely light golden brown, or a mixture of varying amounts of whitish with golden brown or blackish hairs, or almost entirely blackish with a very few golden brown hairs; light colored hairs of elytra often forming subbasal band and distinct subapical spot with other hairs of elytra mostly black. Dorsal integument black, immaculate, or black with subapical rufous spot on each elytron, or with head and pronotum brownish black and elytra ochreous except for brownish area at base and along median suture. Antennal club subcylindrical.

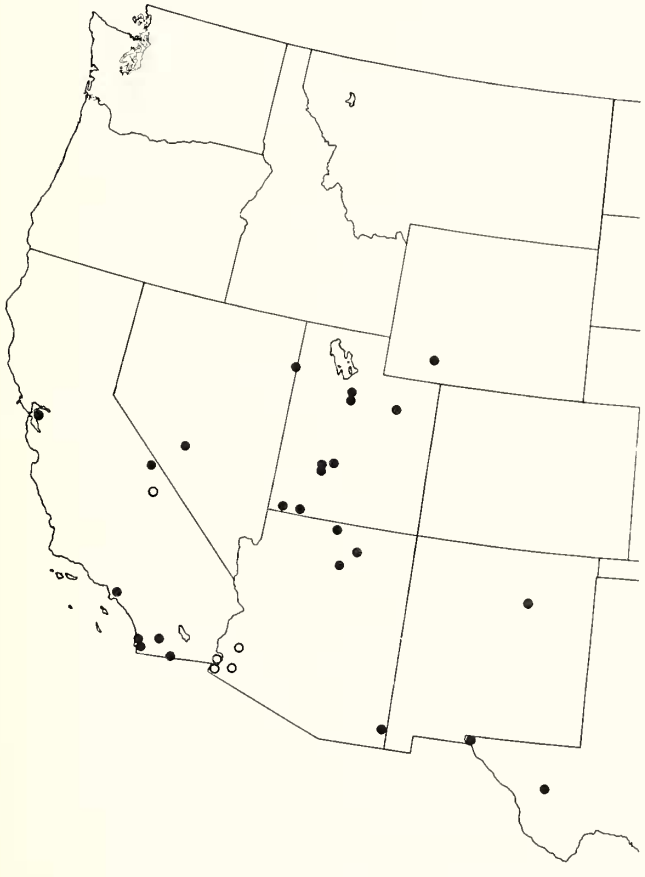


FIGURE 37. Dots, distribution of *C. uteanum*. Circles, distribution of *C. rubidum*.

Pronotum with punctures of disc about as wide as diameter of facet of eye and separated by 1 to 3 times diameter of single puncture. Antennal club ochreous to dark reddish brown; ratio of length of segment 11 to segment 10 varying from 1:1.1 to 1:1.5; ratio of length of segment 11 to segment 10 varying from 1:1.2 to 1:1.7. Antennal fossa at lateroposterior margin not attaining posterior margin of hypomeron; plane of hypomeron continued narrowly behind fossa with plane at narrowest point as wide as ⅔ to 2 times width of antennal segment 3. Pronotal process without median carina or with very narrow impunctate area suggesting median carina. Metasternum with diagonal stria originating at margin behind mesocoxa and extending ¼ to ½ distance toward lateroposterior angle of metasternum. First visible abdominal sternum with single oblique stria extending on each side from anterior margin of segment beneath trochanter to posterior margin. Tibia of front leg widest near middle and tapering gradually toward apex. Eighth (morphological) abdominal sternum with apical median process as illustrated (Fig. 11); two median dorsal setae at apex of process recurved almost 270°, inserted distad to ventral brush of setae with bases separated by distance about equal to width of single socket (Fig. 18). Aedeagus and lateral lobes as illustrated (Fig. 25); base of aedeagus not furcate; apex of aedeagus with short, proximally directed hook; lateral lobes rounding at apices. Ratio of width (across humeri) to length (of pronotum and elytra) varying from 1:1.46 to 1:1.72. Length ranging from 1.87 mm to 2.64 mm (Fig. 2).

ADULT FEMALES: As males except that antennal fossa occupying about half of hypomeron with antennal club correspondingly smaller. 5th visible abdominal sternum without foveae. Ratio of width (across humeri) to length (of pronotum and elytra) varying from 1:1.50 to 1:1.72. Length ranging from 2.12 mm to 2.69 mm.

LECTOTYPE DESIGNATIONS AND NOMENCLATURE: Each of the species synonymized here with *C. apicale* is clearly assignable to it on the basis of dorsal setal characters. The specimen in the NMNH from Tucson, Arizona, bearing type No. 37566 is hereby designated as the lectotype of *C. grisescens* Casey. A male from the same series was dissected and found to have genitalic structures typical of *C. apicale*.

The lectotype of *C. fontinale* Casey is herewith designated as NMNH type No. 37560. It is one of a series of 7 specimens from Jemez Springs, New Mexico. The genitalic structures of one of the specimens are well exposed and serve to verify the identification of the form with *C. apicale*.

The unique specimen of *C. tuckeri* Casey from Tucson, Arizona (NMNH type No. 37555) has not been dissected, but is clearly *C. apicale*.

The unique female type of *C. coloradense* Casey (NMNH type No. 37556) from Golden, Colorado, lacks a distinct subapical spot of light-colored pubescence on the elytron but does have a pronounced subbasal band of light-colored hairs. It falls within the range of variation of the form of *C. apicale* found along the eastern slope of the Colorado Rocky Mts.

GEOGRAPHIC DISTRIBUTION: See the distribution map, Fig. 29. Specimens have also been collected at widely scatterned localities in Mexico as far south as Cuernavaca.

DISCUSSION: For most California specimens the presence of a subapical spot of pale pubescence on the elytron is diagnostic. Usually there is also a subapical rufous area in the integument corresponding with the spot of light-colored pubescence. Specimens from the San Francisco Bay area (Santa Cruz and Santa

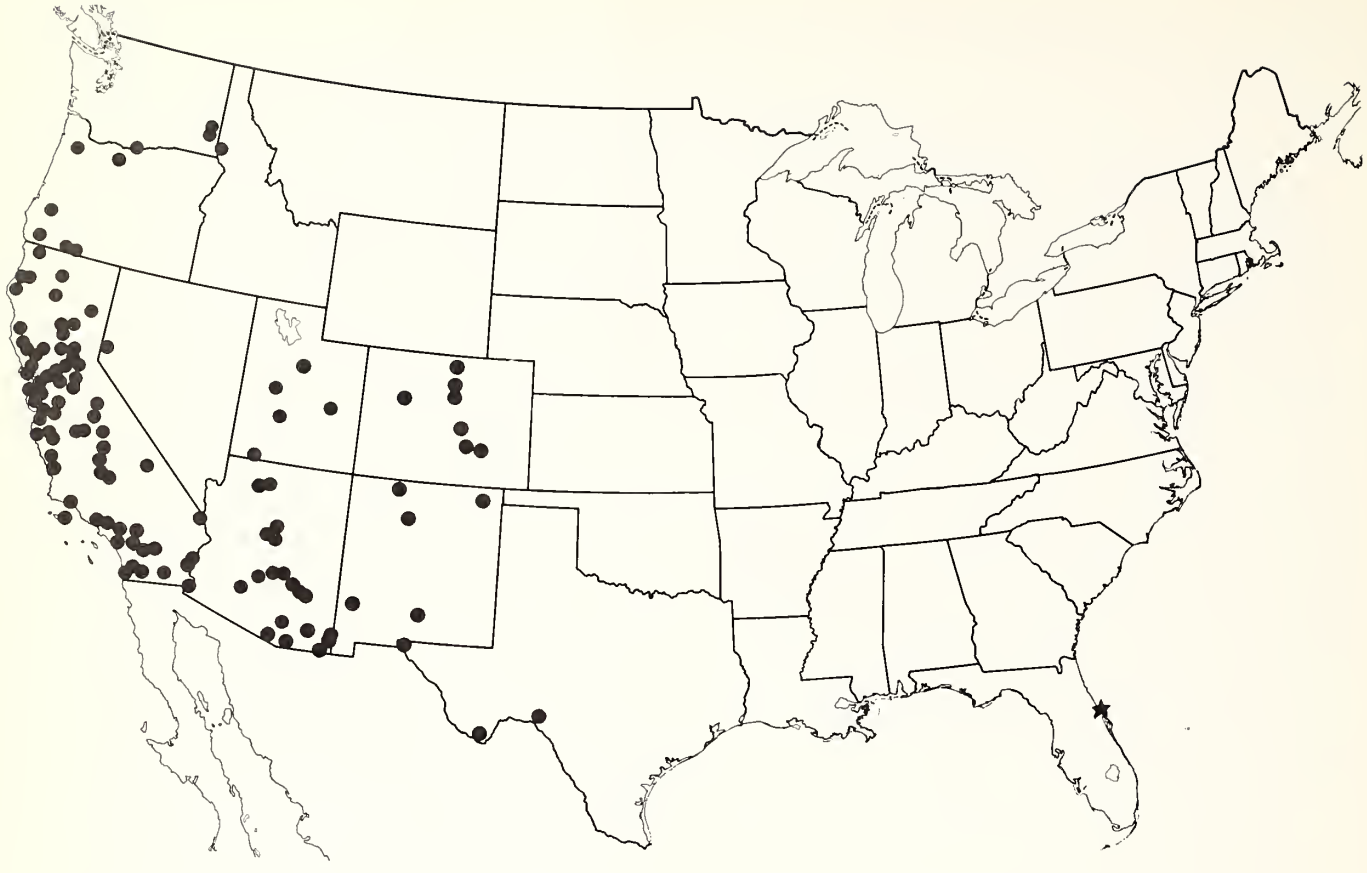


FIGURE 38. Dots, Nearctic distribution of *C. apicale*. Star, Florida locality of closely related unnamed species or form conspecific with *C. apicale*.

Clara Counties north to Marin, Napa, and Solano Counties) often have the apical spot reduced to a very few hairs and very rarely are found lacking the apical spot. Males without a subapical spot can be distinguished from other California species by the slightly broader extension of the hypomeron behind the antennal fossa. Both males and females can usually be recognized by the color of the antennal club, which is a light yellowish brown to a medium reddish brown, but never a dark brownish black. Furthermore, both segments of the club are the same color. The base of segment 10 may be lighter in color than the apex of segment 11, but there is no change of color between the apex of segment 10 and the base of segment 11. Desert forms of *C. apicale* may be covered almost entirely with whitish pubescence, but forms from the California deserts, in contrast to those from Southern Arizona deserts, seem always to have a few intermingled dark hairs, particularly at the apical ⅓ of the elytra. In the case of a few specimens collected near Yuma, Arizona, the "darker" hairs are a light golden brown and are not quickly distinguishable from the whitish hairs.

SUBSPECIFIC VARIATIONS: Because this is a highly polytypic species, it is not surprising that Casey should have described 5 of its different forms as separate species. Each form, however, intergrades more or less completely with neighboring forms. In the north of California and extending south along the Sierra Nevada to the San Gabriel Mountains, specimens are found with the integument black except for a large rufous area on the apical declivity of the elytron. The setae are brownish black except for a few light golden hairs along the lateral and posterior margins of the pronotum, a small lateral patch at the basal ¼ of the elytron, and a prominent subapical patch. In the San Francisco Bay area the apical rufous area is much reduced or absent and the number of light golden hairs is reduced considerably. In the coastal ranges and valleys of Southern California, specimens tend to have a large subapical elytral patch of light golden hairs with a somewhat pronounced subbasal band of light golden hairs. The most abrupt transition occurs between the montane and the desert areas, where the light colored hairs become whitish rather than golden and the areas of light-colored hairs expand to cover the pronotum and most of the elytra.

ECOLOGY: Adults have been recorded from flowers of 14 families of plants. In comparison with the number of collections that have been made of the species, plant records are too sparse to draw any firm conclusions with respect to the factors that may make one plant more attractive than another. In the following list, any plant species on which *C. apicale* has been collected 3 or more times is followed by an asterisk. Liliaceae: *Brodiaea hyacinthina* (Lindl.), *Calochortus venustus* Dougl.*; Salicaceae: *Salix* spp.*; Fagaceae: *Quercus* sp.; Cruciferae: *Brassica* sp.; Capparidaceae: *Cleome* sp.; Rosaceae: *Rubus* sp., *Adenostoma fasciculatum* H. & A.*, *Holodiscus discolor* (Pursh) Maxim., *Physocarpus* sp., *Prunus ilicifolia* Walp.*; Leguminosae: *Melilotus alba* Desr.*, *Astragalus* sp.; Rhamnaceae: *Ceanothus sore-*

diatus H. & A.*, *C. integerrimus* H. & A.*, *C. cuneatus* (Hook) Nutt., *Ceanothus* sp.*, *Rhamnus crocea* Nutt.; Malvaceae: cotton; Tamaricaceae: *Tamarix gallica* L.*; Umbelliferae: *Heracleum lanatum* Michx., *Ligusticum apiodorum* (Gray) C. & R., *Angelica tomentosa* Wats.*, "wild parsnip"; Asclepiadaceae: *Asclepias* sp.; Boraginaceae: *Cryptantha* sp.; Rubiaceae: *Galium boreale* L.; Caprifoliaceae: *Sambucus mexicana* Presl.; Compositae: *Baccharis glutinosa* Pers.* *Baccharis* sp., *Senecio salignus* DC.

In San Mateo County, California, where *C. apicale* occurs sympatrically with *C. triste,* both species occur with moderate frequency on *Calochortus venustus* and *Adenostoma fasciculatum* (P.H. Raven, *in litt.*). *C. apicale* occurs with great frequency on species of *Ceanothus,* on which *C. triste* is taken only occasionally. On the other hand, although *C. apicale* occurs on various Compositae elsewhere in its range, it has not been taken on any composites in San Mateo County. Yet *C. triste* occurs frequently in San Mateo County on a number of composites, particularly *Achillea borealis, Eriophyllum confertiflorum,* and *Lasthenia chrysostoma.*

At Granite Reef Dam, Maricopa County, Arizona, a moderate series was taken on March 18, 1974, on catkins of *Salix* sp. and one specimen on *Tamarix gallica.* However, no specimens could be collected on other adjacent flowers, including *Baccharis* sp., *Nicotiana glauca* Graham, or *Pluchea sericea* (Nutt.) Coville.

Records of occurrence of adults have not been kept for any one locality through a long enough period of time to discover any correlations between dates of their appearance and environmental factors. Across the entire range for the species, adults have been taken between December 30 and October 23. In California west of the Sierra Nevada, the greatest number of collections were made in the two week period from April 22 through May 5. In the deserts of California and Arizona, the greatest number of collections were made in the two week period of July 29 through August 11, no doubt correlations with blooming periods.

Cryptorhopalum fusculum LeConte

Cryptorhopalum fusculum LeConte 1854, p. 111. Reitter 1880 (1881), p. 44. Casey 1900, p. 158.
Cryptorhopalum triste var. *fusculum:* Jayne 1882, p. 367.
Cryptorhopalum anthrax Casey 1900, p. 157 NEW SYNONYMY.
Cryptorhopalum granum Casey 1900, p. 157 NEW SYNONYMY.
Cryptorhopalum affine Casey 1900, p. 157 (non *affine* Reitter 1880 (1881)). Sharp 1902, p. 657 REVISED SYNONYMY.
Cryptorhopalum pumilum Casey 1900, p. 158 NEW SYNONYMY.
Cryptorhopalum caseyi Dalla Torre 1911, p. 73 (nov. nom. pro *C. affine* Casey 1900).
Cryptorhopalum piceum Casey 1916, p. 198 NEW SYNONYMY.

DESCRIPTIONS

ADULT MALES: Dorsal pubescence uniformly light golden to dark golden brown; integument of dorsal surfaces immaculate, mahogany brown to black. Antennal club subcylindrical.

Pronotum with punctures of disc minute, ⅔ times as wide as to equal in width to diameter of single facet of eye; punctures separated by distance equal to 3 to 5 times diameter of single puncture. Antennal club with segment 10 entirely light yellowish brown or light yellowish brown at base becoming fuscous apically; segment 11 usually entirely fuscous but occasionally light yellowish brown at base; ratio of width to length of segment 10 varying from 1:1.2 to 1:1.7 (Fig. 7). Plane of hypomeron continued behind antennal fossa with hypomeron at narrowest point behind lateroposterior margin of fossa equal to or not less than 4/5 as wide as segment 3 of antenna (Fig. 7). Prosternal process transversely flat to slightly concave without median carina or rarely with low, thread-like carina on apical half. Metasternum with short, oblique stria originating at medial margin of mesocoxal socket and extending not more than ½ distance toward middle of lateral margin of metasternum. First visible abdominal sternum with single oblique stria on each side extending from anterior margin of segment beneath trochanter ½ to ⅞ length of segment. Tibia of front leg widest at middle and tapering slightly toward apex. Eighth (morphological) abdominal sternum with apical margin as illustrated (Fig. 8); two recurved setae inserted dorsally on median process; setae of ventral brush inserted apically on process, compactly arranged, with rounding apices (Figs. 34, 35). Aedeagus strongly curved dorsoventrally; apex without proximally directed hook (Fig. 27). Lateral lobes with long, somewhat coarse setae at apices (Fig. 26). Ratio of width (across humeri) to length (of pronotum and elytra) varying from 1:1.51 to 1:1.70. Length ranging from 1.63 mm to 2.50 mm.

ADULT FEMALES: As males except that antennal fossa occupying about ½ of hypomeron and antennal club correspondingly smaller. Fifth visible abdominal sternum without foveae. Length ranging from 2.06 mm to 2.66 mm.

NOMENCLATURE: The female holotype of *C. fusculum* (MCZ type No. 6880) from "Colorado River, California," seems quite certainly to be identical with the species described here. The dark color of the dorsal integument practically excludes its identity with *C. rubidum.* The only California species with which it might be confused is *C. uteanum,* but this does not occur where LeConte probably collected his specimen.

The female holotype of *C. affine* Casey (NMNH type No. 37565) from Benicia, Solano Co., California, is identical with this species. On my advice, Mroczkowski (1968) synonymized *C. affine* Casey with *C. triste* LeConte. A reexamination of the specimen shows that I was in error. The apex of the front tibia is definitely not expanded, as is true of specimens of *C. triste.*

Also identical with this species are the unique types of *C. anthrax* Casey (NMNH type No. 37570), a female from Arizona, *C. piccum* Casey (NMNH type No. 37564), a female from Claremont, California, and *C. pumilum* Casey (NMNH type No. 37571), a female from Arizona. Although confirming genitalic characters are unavailable, these all have setal characters typical of *C. fusculum.* The male type of *C. granum* Casey (NMNH type No. 37569) from Arizona was dissected and found definitely to be this species.

GEOGRAPHIC DISTRIBUTION: See the United States distribution on the map, Fig. 30. In addition to the localities shown on the map, the species has been found in Baja California, Mexico, at the following localities: 10 miles south of Punta Prieta, June 21, 1938 (Michelbacher and Ross), 44 km south of Tijuana, June, 1952 (N.L.H. Krauss), 19 miles east of Rosario, June 17, 1938 (Michelbacher and Ross), and Isla Partida, March 23, 1953 (P.H. Arnaud). It was taken in Sonora, Mexico, at Cumbre del Frente, 3 miles east of Guaymas, April 30, 1952 (J.P. Figg-Hoblyn).

DISCUSSION: Within California this species is most likely to be confused with *C. rubidum* or *C. uteanum.* Normally the dark color of the integument will distinguish it from these species, both of which, in California, at least, have elytra that are apically rufous or entirely rufous or mahogany brown. Occasional speci-

mens of *C. fusculum,* which I take to be teneral, have rufous elytra. In these cases males may be distinguished by the greater width of the hypomeron behind the lateroposterior angle of the antennal fossa in *C. fusculum,* but I know of no satisfactory way of distinguishing such females.

ECOLOGY: In desert areas adults have been collected commonly on flowers of the legumes *Prosopis juliflora* (Swartz) DC., *Acacia greggii* A. Gray, and *Cercidium microphyllum* (Torr.) Rose and Johnston, on flowers of *Tamarix gallica* L., on *Eriogonum* spp., and on mustards of the genus *Stanleya.* Across the entire range of the species, single collections have been recorded from the flowers of each of the following: Chenopodiaceae: *Atriplex hymenelytra* (Torr.) Wats.; Rosaceae: *Pyracantha* sp.; Rhamnaceae: *Condalia* sp.; Asclepiadaceae: *Asclepias* sp.; Compositae: *Aster spinosus* Benth. It was also recorded "in apricots" in Sacramento, California. In the Spring Mts. of Clark County, Nevada (near Bonnie Springs), I collected specimens in moderate abundance on flowers of *Eriogonum* sp. but no individuals could be found on flowers of *Salix* sp. or *Vitus* sp. in the same vicinity.

Cryptorhopalum filitarse Casey

Cryptorhopalum filitarse Casey 1900, p. 156.

DESCRIPTIONS

ADULT MALES: Dorsal integument with head black to light reddish brown, pronotum and elytra mahogany to light reddish brown. Dorsal pubescence consisting of closely appressed, light or dark golden brown hairs and golden white to whitish hairs. Antennal club ovate, rufous.

Pronotum with golden white or whitish pubescence on sides and on basal lobe and golden brown or mixed golden brown and whitish hairs on disc; punctures of disc about as wide as diameter of facet of compound eye and separated by 2 to 3 diameters of single puncture. Elytra with golden-brown hairs, except for light-colored hairs distributed as follows: few hairs or dense band of hairs (as dense as submedian band) along basal margin, narrow submedian band, narrow or broad subapical band, light-colored hairs along lateral margin between submedian and subapical bands present or absent, small or large apical patch; subapical band of light-colored hairs and apical patch occasionally confluent. Antenna with ratio of width to length of segment 10 varying from 1:1.1 to 1:1.2; ratio of length of segment 11 to length of segment 10 varying from 1:1.0 to 1:1.3. Process of prosternum without median carina. Plane of hypomeron behind antennal fossa as wide at narrowest point as 1½ times width of antennal segment 3. Metasternum with or without short, oblique stria originating at posterior margin of mesocoxal cavity. Front tibia widest at middle and tapering gradually toward apex. Eighth (morphological) abdominal sternum as illustrated (Fig. 14); lateral process well developed with terminal seta slender; tuft of simple setae present at apex of slightly expanded median area. Aedeagus and lateral lobes as illustrated (Fig. 23); genital pore simple with small dorsal lobe but without proximally directed hook (Fig. 32). Ratio of width (across humeri) to length (of pronotum and elytra) varying from 1:1.58 to 1:1.64. Length ranging from 1.70 mm to 2.06 mm.

ADULT FEMALES: As males except that antennal fossa occupying about half of hypomeron, and 5th visible abdominal sternum with 2, circular, very slightly depressed foveae, each with diameter about equal to half greatest length of segment and each bounded by feeble, interrupted, thread-like carina (Fig. 33). Ratio of width (across humeri) to length (of pronotum and elytra) varying from 1:1.58 to 1:1.70. Length ranging from 1.74 mm to 2.11 mm.

LECTOTYPE DESIGNATION: The NMNH specimen bearing type label No. 37552, a female, is herewith designated as the lectotype. The specimen bears a label with the letters "Cal," which are underlined. According to the original description, the locality is Santa Barbara, California. One male and 5 females next to it bear the same label. The male was dissected and found to have genital structures similar to those figured here for the species.

GEOGRAPHIC DISTRIBUTION: CALIFORNIA: Imperial County: Santa Rosa Mts., July 4, 1946 (D.J. and J.N. Knull). Inyo County: Inyo Mts., 7,000 to 8,000 ft. elev., July 7–11 (Wickham); Westgard Pass, July 22, 1961 (J.S. Buckett); 3 miles southwest of Westgard Pass, July 18, 1964 (C.D. Johnson). Los Angeles County: San Gabriel Canyon, August 8, 1960 (Fred G. Andrews). Orange County: Fullerton, August 2, 1930 (Bartholomew). Riverside County: San Jacinto Mts., July 21, 1929 (L.D. Anderson). Tulare County: Giant Forest, July 28, 1929 (R.H. Beamer). Tuolumne County: Elizabeth Lake [Yosemite National Park], July 10, 1924 (W. Benedict). Ventura County: Ojai, August 29, 1950 (F.W. Furry). See map, Fig. 31.

DISCUSSION: This species and *C. balteatum* are readily distinguishable from all the preceding species by the presence of 3

FIGURE 39. Nearctic distribution of *C. fusculum.*

or 4 distinct bands of light-colored pubescence across the elytra, by the ovate rather than subcylindrical antennal club, and by the presence of 2 round foveae on the 5th visible abdominal sternum of the female. However, the 2 species are very difficult to separate from each other on the basis of external characters. Genitalic characters easily separate the males. The sternum of the 8th abdominal segment of *C. filitarse* has a tuft of setae at the middle of the apical margin, but these are lacking in *C. balteatum*. The lateral process of the sternum of the same segment of *C. filitarse* bears a slender apical seta, whereas the lateral process of *C. balteatum* bears an apical seta that is about as wide as the apex of the process itself. The aedeagus of *C. filitarse* has a genital pore that is more or less apical with a small proximal lobe but without a proximally directed hook as found in *C. balteatum*.

ECOLOGY: Adults have been collected on flowers of *Eriogonum* sp. and *Asclepias* sp.

Cryptorhopalum balteatum LeConte

Cryptorhopalum balteatum LeConte 1854, p. 111. Reitter 1880 (1881), p. 43. Jayne 1882, p. 365.

DESCRIPTIONS

ADULT MALES: Dorsal integument with head and thorax piceous to black and elytra dark mahogany brown to rufous. Dorsal pubescence consisting of piceous and golden, depressed hairs. Antennal club ovate, rufous.

Pronotum with golden hairs on sides and on basal lobe and with piceous hairs covering disc; punctures of disc about as wide as diameter of facet of eye and separated by 3 to 5 times diameter of single puncture. Elytra with piceous hairs except for golden hairs distributed as follows: few or none along basal margin, patch on humerus coalescing with narrow submedian band, narrow or broad subapical band with none along lateral margin between submedian and subapical bands except for single line of hairs on lateral carina, patch on apex. Antennal club with ratio of width to length of segment 10 varying from 1:0.8 to 1:1.5; ratio of length of segment 11 to length of segment 10 varying from 1:1.2 to 1:1.5. Prosternal process without median carina. Hypomeron behind antennal fossa at narrowest point about 1½ times as wide as antennal segment 3 (Fig. 4). Metasternum with fine, sometimes short stria extending obliquely outward from lateroposterior margin of mesocoxal cavity. Front tibia widest at apical 3/5 and tapering gradually toward apex. Eighth (morphological) sternum with stout, evenly curving seta inserted at apex of lateral process; seta terminating abruptly rather than gradually becoming filamentous; middle of apical margin of sternum without process or cluster of setae (Fig. 15). Aedeagus with ventrally directed hook-like process at apex (Fig. 21); lateral lobes with moderately broad bridge. Ratio of width (across humeri) to length (of pronotum and elytra) varying from 1:1.50 to 1:1.65. Length 1.79 mm to 2.28 mm.

ADULT FEMALES: As males except that antennal fossa occupying about ½ area of hypomeron and antennal club correspondingly smaller. Fifth visible abdominal sternum with 2, circular, very slightly depressed foveae, each with diameter about equal to ¾ greatest length of segment, not or indefinitely margined by thread-like carina. Ratio of width (across humeri) to length (of pronotum and elytra) varying from 1:1.54 to 1:1.66. Length ranging from 2.18 mm to 2.47 mm.

DISTRIBUTION: CALIFORNIA: Kern County, May, 1934 (A.T. McClay). Los Angeles County: Mint Canyon, June 24, 1949 (L.W. Isaac); 2 miles north of Valyermo, June 4, 1970 (R.S. Beal).

FIGURE 40. Dots, distribution of *C. filitarse*. Circles, distribution of *C. balteatum*. Question mark, record of *C. balteatum* for county only.

SYSTEMATICS: The female holotype (MCZ type No. 6875) from San Diego, California, appears to be within the limits of the species described here, but the overlapping range of external characters between this species and *C. filitarse* leaves a small margin of doubt. Two specimens stand under the name in LeConte's collection, but the second, which is *C. pruddeni* Casey, is dated 1879, so is not part of a type series.

As with many other closely related allopatric forms in which there is no evidence of a genetically controlled barrier to reproduction, *C. balteatum* and *C. reversum* Casey could be treated with equal propriety as distinct species or as subspecies. There are consistent differences between the two in setal color, but these seem relatively insignificant in view of the variations of setal color and pattern found across the range of *C. reversum*. Nevertheless, the forms are treated here as distinct species, since consistent differences, however small, do exist and since a relatively wide barrier of desert seems to separate them. Future collecting, particularly along the Mexican border, might necessitate a new interpretation of their status. *C. reversum* presently is known to occur from the Chiricahua Mountains in the southeastern corner of Arizona east to Brownsville, Texas.

DISCUSSION: This species is in the same species group as the sympatric *C. filitarse*. For a discussion of the differences between the two, refer to the discussion under *C. filitarse*. Externally the species is quite similar to *C. pruddeni* Casey (1900), which extends from Yavapai and Coconino Counties in Arizona southeast to Brewster County, Texas, and northeast to Garfield County, Colorado. Externally the two may be distinguished by the fact that the dorsal integument of *C. pruddeni* is more or less unicolorous, in distinction to the contrasting darker pronotal and lighter elytral integument of *C. balteatum*. Also in *C. balteatum* the light-colored dorsal setae are a deep golden color rather than golden-white or whitish as in *C. pruddeni*. The 8th (morphological) abdominal sternum of the males of each is provided with lateral processes which bear at the apex a stout, curved seta. In *C. balteatum* this seta is relatively stout for its entire length and terminates rather abruptly. In *C. pruddeni* the seta is stout at the base but gradually becomes finely filamentous.

C. reversum and *C. balteatum* have apparently identical male genitalic characters. The light-colored dorsal setae of *C. balteatum* are a deep golden color. Specimens of *C. balteatum* lack light-colored setae between the subbasal band and the submedian band of light pubescence. Most specimens of *C. reversum* have a mixture of light and dark setae between these two bands as well as a number of light-colored setae between the basal band and the subbasal band. However, a few specimens of *C. reversum* approach the situation found in *C. balteatum*.

ECOLOGY: The only information is that adults were collected 2 miles north of Valyermo, California, in flowers of *Yucca* sp.

Cryptorhopalum haplotes NEW SPECIES

DIAGNOSIS: Ratio of width (across humeri) to length (of pronotum and elytra) greater than 1:1.86. Eighth (morphological) sternum of male with sublateral papillae on apical margin but without lateral processes or median process; cluster of simple setae inserted along apical margin at middle.

DESCRIPTIONS

ADULT MALE: Dorsal integument with head and pronotum dark mahogany brown; elytra rufous; each elytron with suffused, slightly darker area at about basal ¼ and median ⅓. Dorsal pubescence mahogany brown, suberect; ventral pubescence golden brown, recumbent.

Pronotum with punctures of disc minute, about ⅔ times as wide as width of facet of compound eye and separated by 2 to 4 times diameter of single puncture. Antenna and hypomeron as illustrated (Fig. 3); antennal club reddish brown. Antennal fossa bounded behind by thread-like carina; width of plane of hypomeron at narrowest point behind fossa (exclusive of width of carina) about as wide as ½ width of segment 3 of antenna. Prosternal process without median or lateral carinae, transversely flat. Metasternum without oblique striae. First visible abdominal sternum with single, oblique stria originating beneath trochanter and extending ¾ distance to posterior margin of segment. Tibia of foreleg as illustrated (Fig. 28). Eighth (morphological) abdominal sternum with cluster of setae at middle of apical margin and with small papilla-like sublateral process bearing long, slender setae (Fig. 12). Lateral lobes with somewhat rounding, not truncated, apices; bridge moderately narrow (Fig. 16). Aedeagus with small, proximally directed hook at apex. Length (of pronotum and elytra): 2.38 mm. Width (across humeri): 1.27 mm.

ADULT FEMALE: Integument of head dark mahogany brown; pronotum rufous with suffused darker areas across disc; elytra rufous; each elytron with suffused darker area at about basal ¼ and median ⅓. Antenna and hypomeron as illustrated (Fig. 5). Visible abdominal sternum 5 without foveae. Length (of pronotum and elytra): 3.07 mm. Width (across humeri): 1.54 mm.

RANGE OF OBSERVED VARIATIONS: Pronotum ochreous to dark mahogany with or without light and dark mottled appearance; elytra ochreous to light brown with or without darker, suffused subbasal areas. Length (of pronotum and elytra) ranging from 2.23 mm to 3.07 mm. Ratio of width (across humeri) to length (of pronotum and elytra) varying from 1:1.86 to 1:2.07.

TYPE MATERIAL: *Holotype* male, allotype female, and 7 paratypes: Jacumba (San Diego County), California, June 19, 1951 (D.J. and J.N. Knull). Holotype and allotype deposited in the collection of Ohio State University; paratypes deposited in the collections of the CAS, the LACM, the NMNH, and the collection of the author.

ETYMOLOGY: The specific epithet is formed from the Greek noun ἁπλότης standing in apposition with *Cryptorhopalum* and meaning "simplicity." This is in reference to the simple structure of morphological abdominal segment 8 of the male.

DISCUSSION: The elongated form will easily distinguish this species from any other member of the Nearctic fauna. At least one other species belonging to the same species group occurs in Mexico in the state of Tlaxcala. Whether this species is among those presently described and assigned to *Hemirhopalum* is not known. The Mexican species seems to be readily distinguishable from *C. haplotes* by male genitalic characters as well as by the color of the dorsal pubescence, the shape of the antennal club, and other external features.

ECOLOGY: Quite a few pollen grains were found adhering to the ventral surfaces of each of the specimens, indicating that they were taken in flowers. An examination of the pollen showed it to have come from a plant within the order Rosales, but a species for which the pollen characteristics appear to be undescribed. Other details of the biological relationships of the species are unknown.

SYNONYMIES AND LECTOTYPE DESIGNATIONS FOR *C. REVERSUM* AND *C. PRUDDENI*

Since these two species are very closely allied to *C. balteatum* and since a further understanding of *C. balteatum* probably depends in part on an understanding of its relationships to these 2 species, it seems appropriate to present synonymies that have been discovered for them.

Cryptorhopalum reversum Casey

Cryptorhopalum reversum Casey, 1900, p. 156.
Cryptorhopalum festivum Casey, 1900, p. 156 NEW SYNONYMY.
Cryptorhopalum balteatum Casey, 1900, p. 156 (non *balteatum* LeConte, 1854) NEW SYNONYMY.
Cryptorhopalum pallens Casey, 1916, p. 193 NEW SYNONYMY.

A female from Ft. Wingate, New Mexico, bearing NMNH type No. 37554 is herewith designated as the lectotype of *C. reversum*.

A female from Brownsville, Texas, bearing NMNH type No.

37558 is herewith designated as the lectotype of *C. festivum*.

A female from El Paso, Texas, bearing NMNH type No. 37559 is herewith designated as the lectotype of *C. pallens*. The specimen is badly abraded, so identification with *C. reversum* is conjectural.

The single specimen which Casey identified in his collection as *C. balteatum* is a female labeled only as collected in Arizona.

Cryptorhopalum pruddeni Casey

Cryptorhopalum pruddeni Casey, 1900, p. 156.
Cryptorhopalum insigne Casey, 1916, p. 191 NEW SYNONYMY.
Cryptorhopalum anthrenoides Casey, 1916, p. 194 NEW SYNONYMY.

Three females comprise the series from which Casey described *C. pruddeni*, these taken in Arizona at the "Cañon of the Colorado River" (probably on the south rim of the Grand Canyon). The specimen bearing NMNH type No. 37550 is herewith designated as the lectotype. It appears to be a teneral individual of the species.

The female specimen bearing NMNH type No. 37553 from Jemez Springs, New Mexico, is herewith designated as the lectotype of *C. insigne*.

The unique type of *C. anthrenoides* from the Santa Catalina Mts., Arizona, is NMNH type No. 37557.

ACKNOWLEDGMENTS

This study could not have been completed without the generous cooperation of a number of individuals and institutions. I am indebted for the loan or gift of specimens to William F. Barr of the University of Idaho, the late Lutz Bayer of the University of Wisconsin, Frank F. Hasbrouck of Arizona State University, Charles L. Hogue of the Natural History Museum of Los Angeles County, Paul D. Hurd, Jr., formerly responsible for the California Insect Survey of the University of California, Berkeley, C. Daniel Johnson of Northern Arizona University, David H. Kavanaugh of the California Academy of Sciences, John M. Kingsolver of the Systematic Entomology Laboratory, U.S.D.A., National Museum of Natural History, Vernon L. Kirk of the Entomology and Crops Research Division of the Agricultural Research Service, Brookings, South Dakota, John F. Lawrence of the Museum of Comparative Zoology, the late A.T. McClay of the University of California, Davis, Scott McCleve of Douglas, Arizona, D.H. Pengelly of the University of Guelph, Guelph, Ontario, P.H. Raven of Stanford University, H.J. Reinhard of Texas A. and M. University, E.P. Rouse of the University of Arkansas, Jerome G. Rozen, Jr., of the American Museum of Natural History, M.W. Sanderson, formerly of the Illnois Natural History Survey, Joe Schuh of Klamath Falls, Oregon, Terry L. Seeno of the California Department of Food and Agriculture, C.A. Triplehorn of Ohio State University, Robert H. Turnbow, Jr., of the University of Georgia, Floyd G. Werner of the University of Arizona, and R.E. Woodruff of the Division of Plant Industry of the Florida Department of Agriculture. My thanks are extended to Richard H. Hevly of Northern Arizona University for some plant and pollen identifications. Additional thanks are due C. Daniel Johnson, J.M. Kingsolver, Floyd Werner, and Terry L. Seeno for a critical reading of the manuscript.

I am particularly appreciative of a grant from the Systematic Entomology Laboratory, IIBIII, ARS, U.S. Department of Agriculture, which allowed me as a visiting scientist to study type specimens in the Thomas L. Casey collection and to study material deposited in the collection of the United States National Museum of Natural History.

LITERATURE CITED

ARROW, G.J. 1915. Notes on the Coleopterous family Dermestidae, and descriptions of some new forms in the British Museum. Ann. Mag. Nat. Hist., ser. 8, 15:425–451.

BEAL, R.S., JR. 1959. A key to the Nearctic genera of Dermestidae. Coleopterists' Bull., 13:99–101.

_____ . 1975. Description of adult and larval stages of a new species of *Cryptorhopalum* from Arizona and Mexico (Coleoptera: Dermestidae). Proc. Entom. Soc. Washington, 77 (2):228–233.

BLATCHLEY, W.S. 1910. An Illustrated Descriptive Catalogue of the Coleoptera or Beetles (Exclusive of the Rhynchophora) Known to Occur in Indiana (The Nature Publ. Co., Indianapolis), pp. 1–1386.

CASEY, THOMAS L. 1900. Review of the American Corylophidae, Cryptophagidae, Tritomidae, and Dermestidae, with other studies. Jour. New York Entom. Soc., 8:51–172.

_____ . 1916. Some random studies among the Clavicornia. Memoirs on the Coleoptera, 7:35–292.

DALLA TORRE, K.W. VON 1911. Dermestidae. Coleopterorum Catalogus, 14 (33):39–96.

DILLON, ELIZABETH S. AND LAWRENCE S. 1961. A Manual of Common Beetles of Eastern North America (Row, Peterson and Co., Evanston, Ill.), pp. i–viii + 1–884 + plates A–D.

GUÉRIN-MÉNEVILLE, F.E. 1838. Note sur le genre de Coléoptères clavicornes, nommé par Latreille *Globicornis*, et description d'une espèce nouvelle de ce genre. Revue Zoologique, 1:135–139.

HATCH, MELVILLE H. 1962. The beetles of the Pacific Northwest. Part III: Pselaphidae and Diversicornia I. Univ. of Washington Pub. in Biology, 16:1–503.

HORN, GEORGE H. 1894. The Coleoptera of Baja California. Proc. Calif. Acad. Sci., 4:302–449.

JAYNE, HORACE F. 1882. Revision of the Dermestidae of the United States. Proc. American Philos. Soc., 20:343–377, plates 1–4.

KIRK, VERNON M. 1969. A list of beetles of South Carolina, Part 1 — Northern Coastal Plain. South Carolina Agric. Experiment Sta., Tech. Bull. 1033, pp. 1–124.

LECONTE, JOHN L. 1854. Synopsis of the Dermestidae of the United States. Proc. Acad. Nat. Sci. Philadelphia, 7:106–113.

_____ . 1862. New species of Coleoptera inhabiting the Pacific district of the United States. Proc. Acad. Nat. Sci. Philadelphia, 1861:338–359.

MANNERHEIM, CARL G. VON 1843. Beitrag zur Käfer-Fauna der Aleutischen Inseln, der Insel Sitkha und Neu-Californiens. Bull. Soc. Imp. Nat. Moscou, 16:175–314.

MROCZKOWSKI, MACIEJ 1968. Distribution of the Dermestidae (Coleoptera) of the world with a catalogue of all known

species. Ann. Zool., Polska Akademia Nauk, 26 (3):15–191.

REES, B.E. 1943. Classification of the Dermestidae (larder, hide, and carpet beetles) based on larval characters, with a key to the North American genera. U.S. Dept. Agric. Misc. Pub. No. 511, pp. 1–18.

REITTER, E. 1880 (1881). Die aussereuropäischen Dermestiden meiner Sammlung. Verh. Nat. Ver. Brünn, 19:27–60.

SHARP, DAVID 1902. Dermestidae. *In* Biologia Centrali-Americana. Insecta. Coleoptera, 2 (1):642–669, plate 19.

Accepted for publication July 8, 1977.